THE SCIENCE OF HOME MAKING

A TEXTBOOK IN HOME ECONOMICS

EMMA E. PIRIE

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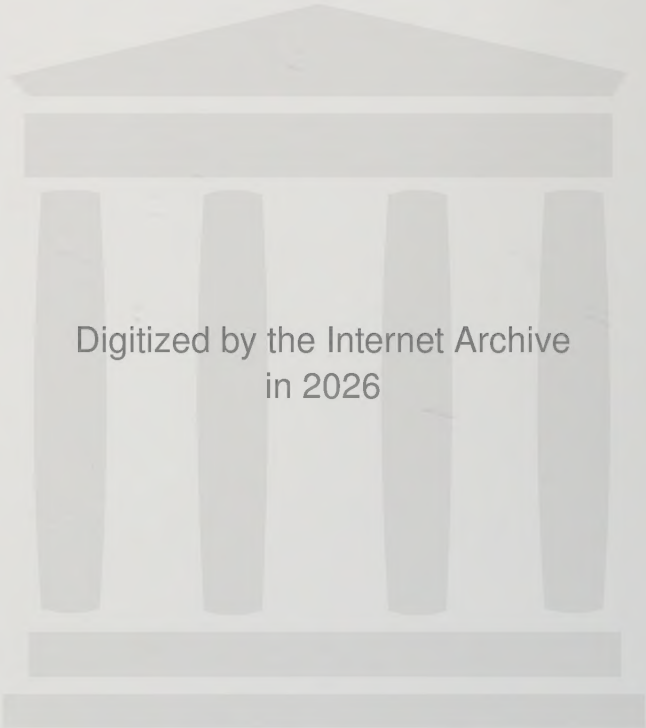
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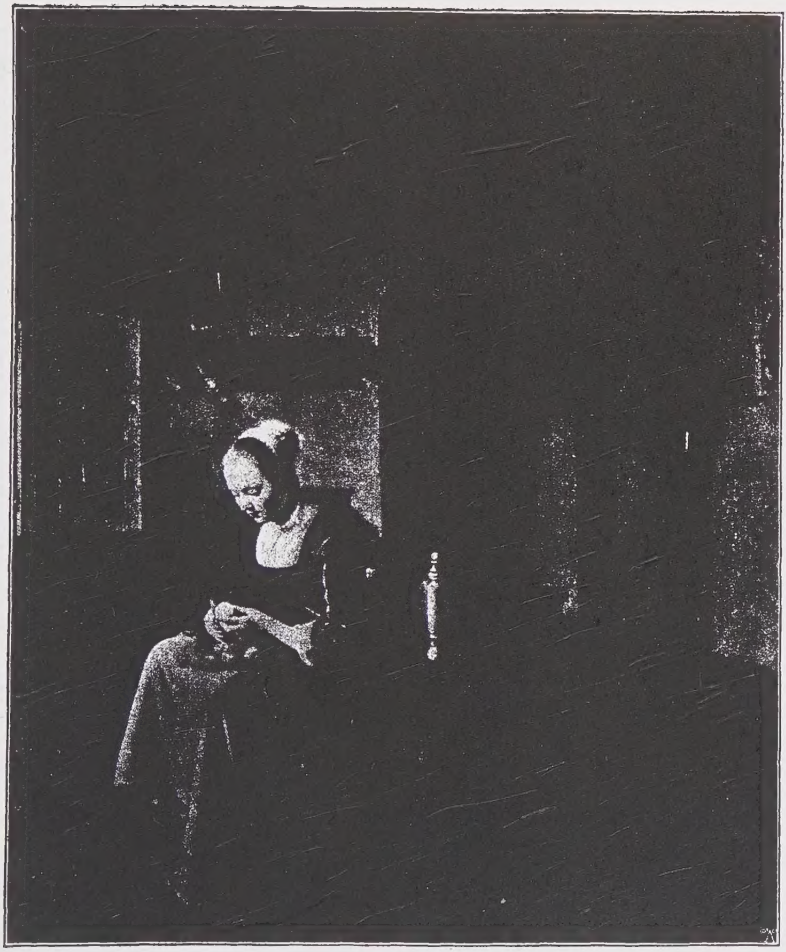

THE HOUSEKEEPER By Gerard Douw

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THE SCIENCE OF HOME MAKING

A Textbook in Home Economics

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SCOTT, FORESMAN AND COMPANY
CHICAGO NEW YORK

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PREFACE

This book is intended for use in the Home Economics classes of the grammar and lower high school grades, both in cities and in rural schools. Technical terms have been used sparingly because where the time devoted to Home Economics is limited, as it is in most schools of this grade, the acquirement of a special vocabulary is not practicable. Few experiments depending on a knowledge of chemistry are included, as pupils are not yet familiar with this subject. Little stress is laid on experimental cooking, because in the author's judgment the aim of elementary teaching in food preparation should be the development of the underlying science, including the physiological facts of food and digestion, and the effect of heat upon food. In addition, the course should secure for the pupil a fair degree of skill in preparing and serving foods.

A large number of supplementary recipes are given in the Appendix. It is hoped that this feature will not only offer the teacher a wide range of choice in the preparation of her course of work, but will also tend to make the book a valuable *cook book* for the home kitchen, after its service as a school text has been rendered. If the hygienic principles of the school cooking lesson can thus be brought into closer relationship to their later use in the home, a very real advantage will be gained.

The teaching in Home Economics should center about the home. It should strive to give girls a realization of the importance of home making in the development of the individual, and of the great part the home plays in the formation of the citizenship of the community and of the nation. Great stress is laid on hygiene and sanitation, including the study of bacteria and hygienic methods of cleaning. These are great economic factors, as the cost of living is much increased by illness due to pre-

ventable disease. In general, unhygienic methods of food preparation are omitted; when given, their evil effects are explained.

The care and feeding of children, including the school luncheon, are emphasized because of the vital importance of these matters on the future of the individual. The study of the school luncheon touches the self interest of the pupils and vitalizes the whole subject of food preparation. The care and feeding of the child are given prominence not only because of their value to the home maker of the future, but because of the emphasis they give to the importance of proper nutrition. The cost of material is everywhere stressed since it is as great a factor in successful household management as it is in any other business.

The author wishes to express her gratitude for aid in preparing the manuscript to Miss Sarah Gibbs, Miss Nannie Dawson, and Prof. Bernard Mackensen of the San Antonio High School; to Miss Mildred McKnight and Miss Grace Umberger for notes on nursing; to Miss Helen Devine, of San Antonio, and Miss Daisy Kugel, of Stout Institute, Menominee, Wisconsin, for helpful criticism; to Miss Otela Kelly and Mrs. Frank Clarkson for drawings; to Prof. Louis D. Hall, of the University of Illinois, for valuable tables and drawings; to Prof. Carl Hartman, of the University of Texas, for the preparation of the chapter on Food and Digestion, and to Dr. Clifford Grulee, of Chicago, for diets for the infant.

Grateful acknowledgment is also made to *Good Housekeeping* for permission to use the illustrations found on pages 128 and 165; to the Washburn-Crosby Co., for the diagram on page 207; and to Prof L. D. Hall and Prof. A. D. Emmett, as well as to the University of Illinois, for the meat illustrations, pages 158, 164, 166, 168, and 172, from Bulletin No. 158, University of Illinois Agricultural Experiment Station.

San Antonio, Texas.

September 20, 1915.

DIRECTIONS TO TEACHERS

The subjects given in this book are arranged so as to give the home the prominence to which it is entitled. The order in which the topics are to be studied will depend on the age and intelligence of the pupils. It may not be desirable to study at first the entire chapter on the home, but it is well to introduce the subject by a discussion of the home and its functions even if the class must pass directly to the preparation of foods.

The best methods of preparing foods and arranging menus cannot be developed unless the pupils possess an elementary knowledge of the digestive processes; to this end the chapter on Food and Digestion should be studied first, unless the regular school course of study has included physiology. While the text is planned to cover two years of work, it may easily be adapted to a shorter period.

For a short course in food preparation it would be well to follow the order given in the text, a few type dishes being selected and that part of the theory which applies to them being assigned for study. The teacher may have the class prepare two dishes at the same lesson, using one as the main topic and the other as a supplement. For example, tea and toast may be prepared in the lesson on water. In this case, the making of tea would be the study subject, and the making of toast would be developed from dictation. The effect of heat upon starches would be left for a later lesson. In general, the matter in large type should be read and discussed and the experiments performed before the practical cooking lesson is taken up. In such chapters as that on meat, however, where there are many points to be covered, it is well to divide the discussion, covering first the points most closely connected with some simple cooking process, following this by the experiment or experi-

ments relating to the process, and then taking up the practical cooking. In this way the interest of the pupil will be sustained.

A good course would include the preliminary lessons on the home, and on food and digestion, followed by a study of the kitchen and its equipment. At this point the actual cooking lessons might begin, first with a study of water, followed by the preparation of the beverage most used by the pupils; next, the study of fruit, and the cooking of some seasonable fruit; then the study and cooking of cereals. Here the breakfast menu might be discussed, followed by table setting, the cooking of eggs, and the serving of breakfast. The care of the dining room might then be introduced (Chapter I, Part One). After this the cost of the meal should be estimated.

The series of type lessons leading to the preparation and serving of luncheon or dinner should then be continued. The subjects in order might well include the preparation of potatoes and rice, the study of milk in cream soups, the cooking of a meat, a quick bread, vegetables, and a simple dessert. Cup custard, for example, would give a review of the milk and egg lessons. After this, fat in salad dressing and sugar in desserts may be studied. The preparation and serving of a company luncheon or dinner may then be given. As a further training on the social side, afternoon tea could be served to the faculty. Following this, a short course on the care and feeding of children and invalids should be given. Laundering may be taught at the end of the course, or incidentally when the care of dish towels, cooking aprons, and table linen is discussed.

For the convenience of teachers in planning their classwork, the type recipes of greatest importance are starred throughout the text. These recipes contain applications of all the fundamental principles taught in the various chapters. Teachers who have time will do well to supplement this list by selecting from the other recipes of the text, those best adapted to their local requirements. Attention is called in this connection to the large number of supplementary recipes contained in the Appendix.

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THE SCIENCE OF HOME MAKING

PART ONE

THE HOME AND ITS CARE

CHAPTER I

THE HOME

The very first home the world ever knew was made by some woman as a safe place for her little child. It may have been only a rude cave which she had made comfortable with soft grasses or the skins of animals, but its purpose was the same as that of the home of today; that is, it was a place where the family could find comfort and companionship and where the children could grow and develop.

To fulfill its duty properly a home must have an atmosphere of order, beauty, contentment, hospitality, and Godliness.

The Home Maker. To be the guiding spirit of an ideal home a woman needs not only the highest qualities of mind and heart, but also a strong body and steady nerves. Perfect health should be the aim of every girl. To this end she should study her physiology and practice what it teaches.

The efficient home maker, in addition to possessing these high qualities of heart and body, must understand in detail everything that pertains to the administration of her household.

THE HOUSE

The structure that holds the home is the house, and much of the comfort of the family depends upon it.

Location. The first thing to consider in the house is its location. One should be guided in the selection of a site for a house by the surroundings, which include the neighbors as well as the physical conditions. Are the people desirable associates for the family? Are their ideals in matters of conduct and education what they should be? We must remember that a family cannot always live to itself. In the physical surroundings, too, there are many factors to be considered. Is there a railway, factory, or mill near by which is disagreeable on account of noise, smoke, or odors? What is the direction of the prevailing winds? Do hills obstruct the breeze? Do surrounding buildings cut off the light or air? Is the locality very cold in winter? Is the site well drained? Is there stagnant water near by? Is transportation to school or business quick and direct? If there are children in the family, one should locate near a good school.

Sanitary Conditions. The sanitary conditions, also, should be carefully considered, as faulty plumbing or an impure water supply may outweigh the advantage of location. What kind of water supply is there? If in a city, is there a sewer connection? If in the country, what disposal can be made of the sewage? Are the outbuildings properly located?

Appearance. Next in importance is the appearance of the house. This should be considered whether one is building or renting, as a building of a forbidding appearance is apt to affect the spirit of the home makers. The color of the exterior should be neutral, never glaring. White may be used where there is much shade. There should be little contrast in the color of trim and walls.

A garden and shrubbery add much to the appearance of the house by making it more homelike. Even if the house is rented, some quick-growing shrubbery and fruit trees should be planted. Ugly buildings may be screened with plants and vines. Plants should never be so near the walls, however, that

the foundation will be kept damp. Flowers and plants should be at the side of the lawn, for a smooth stretch of green grass is always beautiful. Moreover, if the lawn is broken by flower beds, the labor of caring for it is increased.

A kitchen garden at the back, even if small, is very useful. Parsley, mint, and other plants for garnishing and seasoning may be grown in a small bed, while if space permits, a larger garden will furnish delicious fresh vegetables much cheaper than they can be bought.

The Importance of Air. In building or renting a house one should never forget that fresh air is of prime importance. We must have oxygen to keep the body fire burning; if the supply is deficient the digestion is slow, the lungs cannot throw off the wastes, headaches and drowsiness follow, and the general health becomes bad. Every room must have some way of letting in fresh air and letting out bad air. This is best done by means of a grate or transom near the ceiling. The opening need not be large, and may be arranged so that there will be no draft. For the entrance of fresh air a window with a cheesecloth screen may be used, or, if the house is heated by stoves, a pipe from outdoors may open into the room by means of a grating under the stove. Some stoves are jacketed so that this air is warmed before it reaches the person in the room. Whatever the means adopted, an abundance of pure air must be provided. An electric fan, if properly placed, is useful in securing good ventilation. Windows should be planned to afford a good circulation of air, but wall space should be left for the furniture that is to be used.

Full-length window screens are of the greatest aid in securing good ventilation, as the windows can be opened at the top without fear of letting in the flies.

The Doorway. Since one gains his first impression of the interior of a house as its door opens, the doorway must be simple and dignified. A plain wooden door of good proportions is better than one that contains a small square of glass or much carving.

Woodwork. The woodwork of the house should be of simple and harmonious form. Much carving is out of place in a home, for it catches dust and is not beautiful. The baseboard and wooden facings should be flush with the wall, or the edges should be so sloped that there are no ledges to catch dust.

The color used on woodwork must harmonize with that of the wall covering and the furniture. White woodwork is attractive and may be used with almost any other color, but it is hard to keep clean. It would be appropriate in a formal parlor or reception room, but it is not the best for a much used living room. Cream, gray, or even a soft brown may be used, although too deep a brown darkens a room. The woodwork may be finished in a dull varnish, stained and waxed, or painted with a good flat paint.

The Floor. A waxed hardwood floor is durable and easy to care for, but in some localities is very expensive. A smooth pine floor, however, may be painted, or stained and varnished, and then waxed. A light brown is a good color for floors.

The Walls. The general rule is that the wall must be lighter than the floor and darker than the ceiling. A dark color absorbs so much of the light that it may make the room too dark. A light wall on the other hand gives back or reflects almost four times as much light into a room as a dark one. This is true of artificial light as well as of sunlight.

Avoid strong colors. Red or any very bright color makes a room seem small and is trying to the nerves. If a bright color is desired in a room it may be used in a small ornament.

Some colors are warm while others give an effect of coolness. A dark room requires a warm and cheerful color such as a soft cream, yellow, or buff. For a room with much sunshine, cool colors must be chosen. A faint rose or a gray is pleasing in a light room. A delicate blue is a cool color that may be used in a bedroom.

If wall paper is used, the colors should be chosen according to the directions given above. Plain paper gives the best background for pictures, but if a figured paper is used one with

small figures that are not too definite should be chosen. Never select paper with such definite figures that the wall seems spotted.

If the room is very high a drop ceiling in border effect is pleasing and makes the room seem broad. Avoid borders that are darker than the paper or of striking design or color.

THE FURNISHINGS

After the walls, floors, and woodwork, come the furnishings. Here we must choose according to our needs and our pocketbooks, never, however, forgetting that beauty is essential.

Furniture. An object must properly fulfill its purpose; for example, an uncomfortable chair is not beautiful. Never buy cheap carved furniture that is poorly made and difficult to keep clean. It is better to use the plainest painted chairs and tables until one is able to buy really good furniture. Wicker furniture is light and attractive, but hard to keep clean and quite expensive in a good grade.

Rugs. Rugs should be used instead of carpets as they may be easily removed for cleaning. Avoid floral designs except in conventional patterns—that is, a design based on the flower, but drawn so that it is only suggested. Do not use too many small rugs in a room, as this gives a patchy appearance. The rug should lie on the floor so that its length is with the long lines of the room. It should never be turned crosswise. As the floor should be the darkest color in a room, choose subdued colors for it. Plain rugs show dust more than figured ones. A simple fiber rug makes a cheap floor covering.

Curtains. A window is made to let in light and air. A curtain is used to shut out the gaze of the passer-by and to soften the lines of the window, but it must not interfere with the purpose of the window. Use scrim, net, or other soft fabric for curtains. A material that does not catch dust and that is easily washed or cleaned should be chosen. The color should be light; a soft cream harmonizes with almost any finishing. Plain curtains are always in good taste. Never use figured curtains with

figured wall paper. The curtains should stop at the window sill; they should be hung straight with the lines of the window, and should never be looped or draped. Use small rods, and attach the curtains by rings so that they may be drawn aside easily.

Pictures and Bric-a-Brac. Only a few pictures should be hung in a room, and these should be chosen to suit the room in which they are used; family photographs, for instance, are not for display on the walls of the room where strangers are received. To make the picture most effective be sure that the mat, frame, and color of picture harmonize. Gilt frames are used chiefly for oil paintings.

Hang pictures by two hooks with parallel wires. Attach the wire to the top of the picture. In hanging a picture consider the reflection of the light. The light falling on the picture should come in the same direction as the light represented in it. The center of most pictures should be on a line with the eye when one is standing, although in very large pictures it may be below the level of the eye. The shape of the picture should be similar to the shape of the space it is to occupy. Small pictures are more effective if grouped.

Bric-a-brac and statuary must be so artistic that they are worthy of a prominent place if they are to be displayed. Collections of curios should be kept in cabinets. Some good vases are allowable, but a few flowers only are needed in any one room. If a colored vase is chosen it should harmonize with the room and the flowers that go in it; furthermore it should not have a painted design, for the flowers, not a design, are to be the decoration. The form of a vase is important, as one that turns over easily, or looks as though it would, is not attractive.

Lamps. In choosing a lamp, whether for oil, gas, or electricity, study very carefully the form and color. Avoid glaring tones or those that give inharmonious or injurious lights. All artificial light is softened if it comes through neutral shades, especially amber. Elaborate figures and decorations such as

jingling crystals are in poor taste. If brass is used choose plain designs. Brass in lacquered finish may be kept clean easily.

If oil must be used, a low, broad, metal lamp that will not tip over easily should be selected. The oil reservoir should hold at least a pint. A soft, large mesh wick that fills the burner should be used. If the wick is too small much air will enter and mix with the gas in the lamp and perhaps cause an explosion. For reading or any close work a round burner lamp is best.

THE ROOMS OF THE HOUSE

The Vestibule. If the front door opens into the living room, there should be a small vestibule to stop drafts and to provide a place in which to receive the casual caller. Little furniture is needed here. A chair, a simple table with a mirror above it, and possibly an umbrella stand are sufficient. The family coats and rubbers should be kept in a retired corner, never in the main entrance. If a hall is used instead of a vestibule it should be furnished in a simple way. The colors used should be dignified. Brown in furniture and floor covering and cream for walls and ceiling are appropriate.

The Living Room. The living room is the center of the home, for here the members of the family meet in their moments of leisure and here their friends are received. This room should be large, if possible, and a fireplace should be provided (even if it must be reënforced by other heat in very cold weather), for it gives a homelike feeling that nothing else can supply.

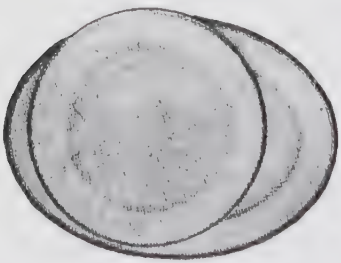
Windows should be large and well placed, and the curtains should suit the furnishings.

Bookshelves will be needed, as well as two tables, one with shaded lamp for reading and the other for games. Chairs should be low and roomy. A couch with a bright soft cover, a few good pictures, a beautiful plant or two, and such other decorations as seem pleasing would complete the furnishing of an attractive living room.

The Dining Room. Unless the family is very large a dining room need be of a moderate size only. It should be a cheery room with just the necessary furniture, a dining table, a serving table, and chairs. There may be in addition a low sideboard and a simple china cabinet if there is no built-in cabinet. Few, if any, pictures are needed in a dining room.

A small pantry between the dining room and the kitchen aids in keeping out the fumes of the kitchen when food is being cooked. If possible, a wall cupboard for china that is in use every day should open into both the kitchen and the dining room, so that the dishes may be carried from the table to the cupboard and taken out on the kitchen side. If the sink and the drying table are just beside this wall cupboard, the dishes when washed can be returned to it and thus many steps saved. A screened porch may be used to advantage for a summer dining room.

The Dishes. Choose dishes of pleasing form, in plain white or in some dainty design in color. Decorations on dishes should be on a part not used for food; for example, a plate may have a delicate border on the rim a little inside the edge. Avoid thick ware, as food served in it is not attractive. In buying china choose what is known as open stock, that is, a pattern sold in any desired number of pieces, so that broken dishes may be replaced without trouble.



A SIMPLE DECORATION

Glassware. Choose plain, clear glassware that is of good proportions. A drinking glass that is tall and narrow cannot be used in comfort, and a top-heavy pitcher may turn over. Do not buy imitation cut glass as it is hard to clean and is easily cracked; in fact, even real cut glass is not always artistic and is expensive and troublesome. Do not buy glass in elaborate designs or in colors.

Silver and Cutlery. Choose silver and plated ware in plain designs, as much decoration catches dirt. Since silver plate is hard to keep in order, use glass and china as far as possible. Steel bladed knives are best for meats that require cutting; but as steel requires even more careful cleaning than silver, it is better to use silver or plated knives where no meat that requires cutting is to be served. The silver plate should not be light in weight. The satin finish scratches more easily than does the polished finish.

ATTRACTIVE PATTERNS IN SPOONS
(Courtesy of Spaulding & Co.)

Table Linen. Select a medium or heavy weight linen of good quality, and buy it from a firm which will guarantee it to be real linen. Choose napkins to match the tablecloth; two sizes are useful, one for dinner, the other for luncheon or supper.

Small doilies for each saucer and water glass, large doilies for plates and dishes of food, and a centerpiece, may be used in place of a tablecloth.

A quilted or asbestos pad under the tablecloth protects the table, improves the appearance of the cloth, and lessens the noise.

The Kitchen. The kitchen should be in a cool place. A northeastern room gets the morning sunshine, and is cool in summer. The windows should be planned so as to give plenty of air, but care should be taken to prevent a draft over the stove. A small kitchen saves many steps. The kitchen table should not be over six feet from the stove. The walls should be painted with a washable enamel paint of a pleasing color. Linoleum makes a most satisfactory floor covering, as it is much easier to clean than wood. It is too cold for the feet in winter, however, and small rugs or strips of matting should be placed by the table, sink, and stove. Linoleum cannot be used unless the floor is even. It should

not be fastened down firmly until it has been used for two weeks as it will stretch and become uneven on the floor.

Furnishings. Provide a good kitchen cabinet, with receptacles for the supplies most used. A table from 28 to 36 inches high, and a stool to correspond, will also be needed. The table should be covered with zinc, aluminoid, or heavy glass. A sink of the right height, about 36 inches, a drain board, and a good

A WELL EQUIPPED KITCHEN

supply of running water are other necessities. If possible have a faucet over the stove to fill kettles. An enameled or soapstone sink is preferable to a black iron sink which rusts and is hard to clean. The space below the sink should be open, and the floor should be protected with a rubber mat.

Shelves and Hooks. Have all shelves and hooks at a convenient height, neither high enough to require much stretching of the arms, nor low enough to require stooping. Make the shelves narrow so that everything may be seen at a glance. Have a

small one for cook books. Place hooks near the place where the utensils will be needed; hang only one utensil on each hook.

The Stove. Unless the kitchen is heated by some other means, use a good wood or coal stove for winter; in summer a gas or blue flame oil stove or an electric stove is to be preferred. Whenever possible, use an elevated oven to save stooping. A coal or wood stove may be mounted on brick or iron.

In selecting a wood or coal stove, choose a plain one of heavy iron. If too thin, it will not retain the heat well. An interlining of asbestos in the oven saves fuel. The firebox must be in proportion to the space to be heated. A very small one requires constant replenishing. The oven must be large enough to bake all that will be required for the family. If a new stove is needed for a kitchen that is already furnished, be sure that the stove will suit the utensils already on hand.

If any other method of heating water is available, do not have the water pipes in the stove as this is the most expensive way. A gas jet or an oil stove should be used for the purpose.

A small alcohol lamp or an electric plate may be used for heating water for tea or coffee. A good fireless cooker or a steam cooker saves much time and fuel.

*Utensils.** Use light utensils with lips and joints attached by rivets rather than solder. Aluminum is very desirable, but if thin it dents easily. As aluminum is slightly affected by acids and alkalies, use thin, light enameled ware for foods containing much acid or where soda is used (as in cooking beans). Discard enameled ware when it is chipped. Tin utensils rust, those of iron are very heavy, and wooden ones are not durable; therefore these materials should be little used. Provide mixing bowls of well-glazed crockery. Glass jars are clean and attractive for storing supplies.

A small kitchen grindstone and a good flexible meat knife are great helps. Provide also long-handled forks, spoons, and skimmers, a long-handled hook for drawing pans to the edge of the oven, and an oven shovel for lifting out pie tins.

* See Appendix, page 385, for equipment of home kitchen.

The Refrigerator. A good refrigerator is not cheap, because the process and the materials used in its making are expensive. It is not economy to buy a poor one, for such a refrigerator will use far more ice than a good one. It should be tile or enamel lined, as zinc is hard to keep clean. All racks and shelves should be of metal, as wood will absorb moisture. The inside corners should be rounded for ease in cleaning. The waste pipe of the refrigerator should never be connected with the sewers. If a pipe carries the water outdoors, see that it drains away promptly. The refrigerator should be conveniently located.

A Cooling Cupboard. On a porch or on the outside ledge of a window, a box may be fixed which can be used for keeping food cool. It should have screened sides, and a curtain next to the house to keep the hot air out.

The Pantry. A pantry or storeroom should be provided next to the kitchen, unless the housekeeping is on a very small scale. It should be well ventilated and lighted. Where no pantry is available, a wire kitchen-safe, that has the bottom covered with screening to keep out mice, may be used.

The Cellar. A cellar should have plenty of windows on opposite sides to give proper ventilation. In a warm climate cellars should be frequently whitewashed, to keep them free from mold.

The Bathroom. Every dwelling, no matter how simple, should have a bathroom. If there is running water in the house, the bathing problem is easy, as a bathtub and toilet can be installed for sixty dollars or even less. Choose a porcelain or enameled tub, and place it far enough away from the wall to enable one to clean under and about it easily; or have it flush against the wall with a solid base resting on the floor. The floor of the bathroom, if not tiled, may be covered with linoleum. A small washable rug should be provided. Shelves of glass on metal brackets and glass towel rods are the most hygienic for the bathroom.

The Toilet. (See page 36.) Although it is best to have the toilet or water closet apart from the bath it may be put in

the bathroom. Choose a bowl that is quite low, and with as little wood about it as possible.

Study the plumbing system carefully and note arrangement of pipes and traps. Water stands at the bend in the pipe where the trap is located, to prevent the entrance of sewer gas. This is called the water seal. In plumbing fixtures which are seldom flushed this water may evaporate. Note the location and arrangement of tanks for flushing and the size and condition of each pipe. Are they apt to become clogged? See that the joints in pipes are perfect. All plumbing fixtures should be connected with escape pipes which extend above the roof. Where is the connection made? If there is no sewer system consider carefully location and arrangement of cesspools or septic tanks. The latter is to be preferred to the former. (Write to the United States Department of Agriculture for the bulletins on "Comforts and Conveniences of Farm Homes" and "Plans for a Septic Tank.")

The Bedroom. The floor of the bedroom should be bare except for small rugs placed where they are needed. As the bed is the most important piece of furniture in the room, one should buy the best springs and mattress possible. Wire springs should have a stout covering to protect the mattress from rust. The bed itself should be plain and of pleasing form. White enameled metal beds are the easiest to keep in order. Brass beds are attractive, but they are hard to keep polished. Never buy elaborately carved wooden beds with wicker insets. They catch much dust and cannot be kept clean. Chiffoniers and dressers should be roomy. All heavy furniture should be on rollers that work easily. Low chairs and a small table are the only other necessary pieces of furniture.

Good woolen blankets will outlast many pairs of cotton ones, are warmer and more comfortable, and can be easily cleaned. Comforts, or puffs, as they are sometimes called, cannot be well cleaned. Good feather pillows are durable and comfortable.

Sheets should be of smooth material; they must be large enough to tuck in around the mattress on all sides, and the upper

sheet should be long enough to fold several inches over the top of the blankets.

If there is a stationary washstand in the bathroom washstands are not needed in the family bedrooms. One should be provided, however, in a guest chamber. A metal framework, with a glass top is preferable. The space underneath should be open.

There must be plenty of well-lighted and ventilated closets for clothing. These should have shelves arranged low so there will be no strain in reaching.

The Stairs. If the house has more than one story, stairs are a necessary evil and must be planned for comfort in climbing. A stair that is easy to climb has a rise of about seven inches with a tread ten inches wide, exclusive of the part that overlaps. If the rise is too high, climbing is difficult; if too low, the jar of each step is great; if the tread is too narrow, one is apt to stumble. The stair should never be less than three feet six inches in width.

QUESTIONS AND PROBLEMS

Does the word home mean only the house, or does it include the atmosphere or feeling that centers in the family? What are some of the qualities of a real home? Mention some way in which these blessings may be secured. Do they depend on wealth?

Why is the location of a house so important? Select a suitable location for a home in your community. Enumerate some of the factors to be considered. What sanitary points must be considered in selecting a house? What kind of water supply have you? Is it safe?

Why is the appearance of a house so important? What color would you choose for a house in the location you have selected? Why? Bring a picture of a house that you like. Plan a lawn and flower beds suitable for your climate.

Make a list of fruit trees that you could plant. Plan a kitchen garden.

Is the woodwork in your home easy to dust? Could it be improved? What color would you select for your woodwork? How would you finish it? How would you finish a pine floor?

Why is color so important in wall coverings? What color would you choose for a dark room? For a well lighted one? For your dining room? Why avoid red? What color would you select for the ceiling of a dark room?

Which do you prefer, tinted or papered walls? Why? Compare cost. Select samples of wall paper, and consider carefully their design and color. How could the apparent height of a room be decreased?

What are some of the points to be considered in selecting rugs and curtains? How should pictures be hung?

Select a picture of a good lamp suitable for the living room table. Mention some essential points in choosing lighting fixtures.

Tell how a dining room should be furnished. What dishes would you select for your table? Describe good glassware. What designs in silver and plated ware do you like? Which scratches more easily, polished or satin finished silver? What is the price of table linen of good quality? What good designs have you seen?

Draw a plan for a convenient home kitchen, marking location of sink, table, cabinet, etc. What color would you choose for the walls? How would you cover the floor? Can a kitchen table be artistic? How would you cover yours? How high should it be to suit you? Why provide a stool? What is the proper height for your sink? If there is no running water in your kitchen, make an estimate of the cost of securing it. What kind of sink will you want? What are the important points in arranging shelves?

How can your stove be placed at a convenient height? Why is a good stove so important? Give some important points in selecting one.

What utensils or appliances used in the school kitchen do you need in your home? Make a list of utensils and furnishings needed for a family kitchen, giving size and price.

If you do not have a bathroom, estimate the cost of equipping one with tub, seat, and wash bowl. How should the tub be arranged? How would you finish the floor?

Describe the furnishings of a bedroom. How much would they cost? What length is required for sheets?

Find a plan of a house that would suit your family. Select samples or pictures of furnishings for each room. Illustrate your color scheme for each room, either with sketches in water colors or with pictures and samples.

CHAPTER II

HOUSEHOLD SANITATION

Yeasts, molds, and bacteria are microscopic plants, that is, plants so small they can be seen only under the microscope. For a long time it was believed that these tiny bodies were small animals, but scientists now agree that they are plants.

Yeast. The yeast plant is larger than a bacterium. Tell what you can about it. In what form is it offered for sale?

Mold. Mold is another plant of this class. Mildew on clothes and mold on bread or jelly are simply large groups of these plants growing together. Molds grow in some kinds of cheese and give it a special flavor. In general, however, molds are dangerous to health, and molded food should be thrown away. To prevent the growth of mold, protect food and clothing from dust and dampness.

EXPERIMENT I.—Put a soft piece of corn bread in a damp, warm place exposed to the dust for a few days. Note the result. Leave a little thin sugar syrup in a like place. What effect has warmth and dampness on mold growth?

Bacteria. The third class of minute plants is bacteria. Louis Pasteur, the great French scientist, was the first to make a thorough study of these plants and his work has done much for mankind. Before his day physicians did not know that diseases are caused by special germs; through this knowledge they now prevent or cure many diseases.

How Bacteria Grow and Spread. Bacteria are so small that many hundred millions might lie on the head of a pin. When dry they float about in the air on particles of dust; when they fall on good soil, whether it is a break in the skin, a bowl of soup,

or a jar of fruit, they begin to grow and multiply. As they grow, waste products are formed and these wastes are sometimes poisonous. Some bacteria, as those found in butter and cheese, are useful in giving flavor to food. Some change materials in the soil to a form that can be used by plants that furnish us with food. Other bacteria do harm by causing food to spoil; still others cause disease. Bacteria that cause disease are sometimes called germs. Typhoid fever, diphtheria, and tuberculosis are some of the diseases caused by them.

Most bacteria grow best in dark, damp, warm places, where there is suitable soil. Like all plants, they need food, air, heat, and moisture. But, unlike plants, their best food is found in the substances which human beings eat.

How Bacteria Are Destroyed. Bacteria are destroyed in different ways. Drying will kill many of them; strong sunlight, too, destroys most disease germs, but not all bacteria. A boiling temperature long continued will kill most of them, although those that form spores cannot be destroyed in this way but must be heated on successive days. The spores may be compared to seeds. A sprouted seed is easy to kill, while a hard, dry one is not. By reheating the food on three successive days a part of the spores are killed on each day as they begin to grow. Cold does not destroy bacteria but puts them to sleep; when they become warm they again begin to grow.

Study of Bacteria in Dust. Procure two Petri dishes from your druggist or dealer (a Petri dish consists of two shallow glass dishes, one of which fits over the other as a lid), or use small, clear glass bowls and sheets of thin, clear glass for the lid. To prepare a suitable soil, make beef jelly as directed below.

Jelly for Petri Dish. Chop fine one-fourth pound lean beef. Mix this with 1 cup warm water.

Heat in double boiler, stirring often until water in pan has boiled for fifteen minutes. Remove inner kettle, place directly over the fire, and boil for ten minutes. Strain through cotton flannel. Add one-fourth teaspoonful bicarbonate of soda and enough water to make one cup of liquid. Moisten three tablespoonfuls of gelatin in cold water and add to the hot liquid. When dissolved, strain through hot flannel.

Put three or four tablespoonfuls in several small bottles, cork with cotton, and tie a thick pad of cotton over each. Place the bottles on a folded cloth in a pan of cold water and boil for fifteen minutes each day for three days, so that all bacteria may be destroyed. Then the jelly is ready to use in Petri dishes. Keep in a cool place. When ready to use the jelly, melt by placing the bottles in cold water and heating gradually just enough to melt the jelly. Cool slightly, and use in Petri dish.

EXPERIMENT II.—Wash the dishes very clean, tie on the lids, and sterilize by boiling or baking. When the dishes have cooled lift the lid and pour in a little jelly from the bottles of the beef preparation which has been melted and slightly cooled. (Jelly can be taken from a bottle but once, as bacteria are likely to enter as soon as it is opened.) Turn the dish so that the bottom will be coated well, then expose it to the air for thirty minutes in a room that has just been dusted with a feather duster. Cover the plate and keep in a warm room—not over 70° F., for a week. Expose the other dish in a room dusted with an oiled duster according to directions, page 31. Note carefully any changes that occur on the surface of the jelly. Examine it under a magnifying glass. At the end of a week lift the cover and smell the contents. Examine a speck from the surface with a microscope.

QUESTIONS AND PROBLEMS

Name the three classes of microscopic plants. Are bacteria plants or animals? What do they require for growth? What conditions are most favorable for growth of molds? Tell what you can of Pasteur's great work. Where are bacteria found? Mention some helpful bacteria. Some harmful ones. Some germs. When are bacteria called germs? How may bacteria be destroyed? What is meant by spore-forming bacteria? How may germs be rendered harmless? Describe the preparation of Petri dishes, giving reason for each step. Why should all food be protected from dust?

THE CARE OF THE HOUSE

In the preceding paragraphs it has been shown that dust frequently carries the germs of disease or mold and yeast spores which cause food to spoil. Therefore, cleaning the house so as to remove the dust and dirt is of great importance to the health.

Methods of Cleaning Floors. Remember that the dust you raise in trying to remove the dirt will soon settle in the place you have cleaned, so stir up as little as possible. For ordinary floors use a long-handled brush and one of the oils made for the purpose. A dry cleaning mop or a broom covered with a sack

or soft cloth may be used on polished floors. The best method of cleaning rugs and carpets is by using a vacuum cleaner; the next best, a carpet sweeper. If a broom must be used, dampen it. Sweep rugs and carpets in the way in which they were woven (you can tell the direction of the nap by the feeling). To clean mattings, first sweep, then wipe with a damp cloth. Never wet them.

Start at one corner of the room, and brush lengthwise of the boards. Be sure to keep the broom close to the floor. Stand on the clean portion and push the broom before you. Hold it almost upright on the dirt collected for a moment; then lift the broom and remove any particles that cling to it and brush the next space. When the middle of the floor is reached, begin again to sweep at the opposite side of the room. Never sweep dirt from one room to another. Collect the dirt in small piles.

Taking Up the Dirt and Dust. Cover the dustpan with a piece of damp paper, arranged so that it stands high at the back, in order to prevent the dust from flying; then brush the dirt into the pan with a small hand brush. If there is much dust, it is well to cover your mouth and nose with a thin damp cloth. Burn all the dust. It may be put in the kitchen stove, but never while food is being prepared. Keep the dampers open while the dust is burning.

The Stair. In sweeping the stairs, clean the corners carefully, and brush the dirt from each step into a dustpan covered with a damp paper as described. Hardwood stairs should be wiped with a damp or oiled cloth.

Dusting. Dust the room two hours after it has been swept; use a soft cloth slightly dampened or oiled; gather the dust into a part of the cloth, fold over the cloth, and dust the next portion. Dust the highest part of the room or furniture first. Then wipe the woodwork and floor with a slightly damp cloth. After the dusting is finished, wash the dust cloth.

To Clean a Room Thoroughly. Open the windows, unless the wind is high. Dust and put away all small articles; wipe

the dust from the chairs and take them from the room; dust pictures and ornaments, and pieces of furniture that are too large to remove, and cover them with cloth or paper. If a bedroom is being cleaned, take the coverings out of doors unless the weather is too damp; shake well and hang in the sun and air; using a soft cloth, wipe the dust from the mattress, and air it; brush the springs and bed corners well with a stiff brush, then cover with a sheet while the room is being swept. Dust the shades and roll them up; take down curtains and, if possible, shake them out of doors, fold, and put out of the dust. Clean the washstand crockery, and take it out of the room; wash windows if necessary; clean electric fixtures, door knobs, etc. Fold the rugs so that the dirt will not fall out and take them out of doors. Close the doors and sweep. Wipe the floor if it is necessary. After two hours, dust the room and replace the furniture. A thorough cleaning in this way once a week is far better than a little stirring of the dust every day.

Cleaning the Rugs. Turn the rug upside down on the grass and beat with a whip. Wipe off the back of the rug with a damp cloth. Turn it over and wipe a strip lengthwise; fold over this strip and wipe another; continue until all is cleaned. Rinse the cloth when it is dirty. If the rug is too large to move, wipe a strip on top of the rug, then on the underside, then the floor; fold over the clean part and continue until half is done; then begin at the other end. Small rugs may have all of one side wiped at once.

Fleas may be the carriers of disease germs, particularly of bubonic plague, which they carry from rats to human beings. Fleas or their eggs may find lodgment in floor coverings if pet dogs or cats are kept in the house. A thorough brushing will remove them from rugs, but in mattings they can be destroyed only by fumigation with formaldehyde gas.

Woodwork. Wipe varnished woodwork with a cloth dipped in a little furniture polish or oil, then rub off the oil with a soft dry cloth free from lint. All woods must be rubbed with the grain when being polished.

Furniture Polish. For the polish, use equal parts of linseed oil, vinegar, and turpentine. Mix well and shake before applying.

Painted woodwork may be cleaned with cold water and whiting, or with warm water. Alkalies such as borax and soap should be avoided, as they soften paint. Enamel paint should be cleaned with warm water.

Cleaning Windows. Dust the shades and curtains and remove them; dust the windows well with a soft cloth; wash the woodwork if necessary; and clean the corners carefully, using a rag on a skewer. Wash the glass with clear water and ammonia. Use plenty of clean soft cloths, and polish until dry. Never wash windows while the sun is shining on them. Some of the patent preparations lessen the labor in cleaning windows and are very satisfactory.

Care of Floors. A waxed floor should be cleaned with a dry cloth or mop, or one that is only slightly damp. Never use a broom on a waxed or polished floor. Rub it occasionally with a weighted brush to renew the polish. An unpainted kitchen floor should be cleaned with warm water and soap, and dried as soon as possible to keep the wood from softening. An oiled floor should be wiped with a soft cloth. Do not use soap and water on it. Linoleum may be wiped with warm water and soap.

Daily Care of a Bedroom. As soon as you arise in the morning, take the covers from your bed and spread them on chairs in the sun and air. Then roll the bed into the sunshine. Let the room air if possible before cleaning it. Put away all clothing; hang night garments in an airy closet; never fold them under pillows. Straighten the dresser. All crockery or other utensils used in a bedroom should be kept very clean. Rinse with cold water, wash with warm soapy water, then dry and air. Disinfect twice a week as directed for plumbing. (See page 36.)

To Make a Bed. Turn the mattress. If a pad is used, place it in the center of the mattress with the hems down. Put on the under sheet, right side up, center fold in center of mat-

tress, wide hem at top. Allow more of the sheet at the foot than at the head. Tuck in the sheet neatly at the foot. Do the same at the head. Then arrange the sides. Finish by making corners square. Put on the upper sheet, wide hem at the top even with the top of the mattress, and tuck it in at the foot.

It is better to keep the blankets in an airy place until night. Put on the blankets with open ends at the top. Leave the ends about twelve inches from the top of the mattress. Tuck in at the foot. Turn the sheet back over the blanket and tuck covering in at the sides. Leave everything smooth.

If the counterpane or spread is to be used at night, put it on with the top even with the top of the blanket, fold the sheet over it, and tuck it in at the foot. If the spread is used only in the daytime, put it even with the top of the mattress and do not tuck it in at the foot.

Lay the pillows flat on the bed with the open end out and tuck the seam underneath. Do not use pillow shams or elaborate cases that must be removed at night.

Watch carefully when you make the bed, and if you find either bugs or eggs, clean the bed immediately. The bugs are killed by gasoline or oil of cedar put on with a brush, or put into the cracks with a machine oil can. *Never use gasoline where there is a light or a fire.* After cleaning the bed, air the room for several hours before a light is taken into it. Wash wooden slats thoroughly with a stiff brush to remove the eggs. Remove the eggs from the mattresses with a damp cloth. After cleaning wooden beds, fill the cracks with laundry soap or putty, and varnish or paint well.

Arranging the Bedroom for the Night. Remove the spread and fold it carefully, unless it is to be used. Turn the covers down one-fourth of the way. Bring in a small pitcher of fresh water and a glass, and cover them with a napkin. Refill the washstand pitcher, empty waste water, and bring fresh towels if needed.

The Care of Lamps. Always keep globes clean whether used for electric, gas, or oil lamps. Never use a half-filled oil lamp that has been standing for a day or two. Wipe the chim-

ney with a soft paper, wash in hot soapy water, and dry while warm with a soft cloth. Trim the wick by cutting off the dark part evenly; if it is a flat wick, trim off the corners so that they will be lower than the center. Wipe the burner with a soft paper and see that the air holes are not clogged. Fill lamps to within an inch of the top, screw on the cap, and wipe off all the oil. *This work should be done in daylight. Never fill a lighted lamp. Do not keep the oil can near fire.*

When lamp burners become clogged, take out the wick and boil the burner for ten minutes in two quarts of water to which two tablespoonfuls of washing soda have been added; wipe dry, and then put in the wick.

The Dining Room and Kitchen. In cleaning the dining room and kitchen, leave no crumbs, grains of sugar, or other foods, as ants, roaches, or water bugs may be attracted. Never sweep or dust the dining room just before serving a meal, as it is better to have the dirt on the floor and furniture than in the food. Do not keep the tablecloth on all day, but remove it after crumbing, fold it in the creases, and lay it away. Set a plant or a vase of flowers in the center of the table on a centerpiece. Sweep the kitchen after all food and utensils are put away.

Keep food in tight receptacles or put the legs of cupboards in vessels of oil or water to keep away ants. Use some of the powders or pastes to destroy roaches.

Care of Bathroom. Let sunshine and air in daily. Remove the rug and wipe it, dust all furnishings, clean all plumbing fixtures with soap and water, and rub the floor with a soft oiled brush. Take away damp towels. Then replace the rug. Clean thoroughly once a week.

The Plumbing. To prevent dust from accumulating in the overflow pipe of the bathtub or stationary washstand, spray well with hot soap suds, using a machine oil can. Keep all fixtures perfectly clean. Clean an enameled bathtub by wiping it dry, then rubbing it well with a little kerosene oil on flannel, and finishing with dry flannel. Marble and tiles may be cleaned with

a soft cloth and soap and water; stained marble with whiting. A solution of muriatic acid may be used on porcelain and enameled plumbing to remove the stains. Pour a little of the acid over a mop or rag fastened on a stick, rub it over the surface, and wash off quickly. Wipe and polish faucets.

Disinfecting Plumbing Fixtures. Where there is contagious or infectious disease, the closets should be disinfected; for this purpose, use six ounces of carbolic acid crystals dissolved in a gallon of boiling water. Let it stand for one hour.

Another good disinfectant is made by dissolving sixty grains of bichloride of mercury and one tablespoonful of common salt in two gallons of hot water. Do not put this in metal fixtures. *Both of these disinfectants are poisonous and must not be left where children can reach them. Do not spill the solution on the skin.*

Keeping the Air Moist. It is important to keep the house properly warmed and at the same time to secure a good supply of fresh air that is not too dry. Moisture is needed with any heating system, but particularly with stoves. The effect of too dry air on the linings of the throat and nose is to cause them to become swollen and irritated, a condition which leads to colds. A vessel of water should be kept on every stove, the surface of the pan being comparatively large so that there is enough evaporation to keep the air moist. Too much moisture, however, is not desirable. Furniture kept in rooms heated by stoves not supplied with water becomes cracked and drawn. Steam and hot water heating systems are supposed to provide for sufficient moisture, but many do not. Damp cloths may be hung near the radiator if more moisture is needed, or pans filled with water may be attached.

The Proper Temperature. Many colds are caused by a person's becoming too hot or too cold. Some people are not so much affected by such changes as others, but even they should take no risks.

The best physicians agree that from 68 to 70 degrees Fahrenheit is the safest temperature for health; on a damp day 70

degrees is not too much. On a bright, sunny day 68 degrees would probably be right. For old persons or children, 70 degrees is desirable; for the very weak or delicate even this may not be warm enough. Sitting in a room with a temperature of 65 degrees is dangerous.

The Care of the Yard. Keep the yard clean and dry. Drain wet places; repair leaking hydrants; cover the top of tanks, cisterns, or receptacles containing stagnant water with a thin film of kerosene oil. Mosquitoes lay their eggs only in water, so if oil is used the larvae known as wiggletails will be destroyed, and the adult mosquito will be killed by the oil that adheres to her body when she lays her eggs. Burn trash and prune trees if they prevent the access of sunlight. Do not allow garbage to accumulate. Flies breed in moist, decaying filth, particularly manure. Screen manure piles and cover garbage pails. Gnats also thrive in moist places.

Disposal of Wastes. Do not throw dish water near the house. See that all waste water drains away quickly.

Protection of Water Supply. If a well is used, see that no seepage from closets or stable yard can reach it. Provide a high curb that will prevent surface water from entering it; have a tight cover, and do not let poultry perch on it. If buckets are used, be sure that they are clean. Do not let water run into the cistern until the dirt has been washed from the roof. Keep gutters clean. Screen the cistern and protect it from birds. Pigeons have been known to carry typhoid germs from closet to cistern.

The Outdoor Closet. There must be no overflow from pit or receptacle. It must be securely enclosed so that poultry and animals cannot reach it, and should be oiled to prevent the breeding of mosquitoes. The closet should be scrubbed frequently. A box of lime and a small shovel can be kept at hand, and whenever the closet is used a shovelful of lime should be thrown in.

Never throw discharge from persons ill of infectious or contagious diseases into the closet until it has been disinfected. Use

a carbolic acid solution, which has been well stirred, and allowed to stand for an hour.

The Greatest Disinfectant. As sunlight destroys more germs than any amount of disinfectants, there cannot be too much of it in house and yard. Do not be afraid of spoiling the furnishings; it is far better to have faded wall paper than pale and faded human beings.

QUESTIONS AND PROBLEMS

What is dirt? What diseases may be carried in dust? What should be used in cleaning floors to keep the dust from rising? Tell how to sweep. How should the dust be taken up? What should be done with it? How should the stair be cleaned? Why wait for two hours after sweeping, before dusting? Why use a slightly dampened or oiled cloth? Give the order in which the room should be dusted. Tell how to clean a room thoroughly. How should a large rug be cleaned? A small one?

How should polished woodwork be cleaned? Painted woodwork? Give directions for washing windows. For cleaning floors.

What should you do to your room and bed as soon as you are dressed? Give directions for daily care of bedroom. Tell how to make the bed. How should you arrange the bedroom for the night?

Why does the bathroom need such careful cleaning? Tell how to clean the bathtub and toilet. Give directions for disinfecting the toilet.

Why is moisture needed in stove-heated rooms? What is the proper temperature for strong, well people? For children and old people? For the sick? Should the room be warmer on a damp day than on a dry cold day?

How should wells be protected? Cisterns? How can the breeding of mosquitoes be prevented? Where do flies breed? How should outdoor closets be treated? What is nature's greatest disinfectant?

PART TWO

THE SELECTION, PREPARATION, AND SERVING OF FOOD

CHAPTER I

FOOD AND DIGESTION

WHY WE NEED FOOD

For Warmth. In answering the question why we need food, we may compare the body with a stove. During life the body is warm—it is filled with the "fire of life." Like a stove, the body consumes fuel, and, as in the stove, oxygen from the air is necessary to burn the fuel for the production of heat. In the stove the air from the draft furnishes the necessary oxygen; in the body, it is the air that is breathed.

For Work. We may also, and more aptly, liken the body to an engine; for an engine not only consumes fuel and becomes warm but it also does work, produces motion, and runs machinery. In exactly the same way our bodies, consuming food, are enabled to do work. When we climb a hill or run, we are doing work. Even when we rest, our heart engines keep up their work and our breathing movements continue. Throughout life we need food for work as well as for warmth.

For Growth and Repair. The body is, however, more than an engine. Each is constantly wearing out its parts, but the body alone can repair itself. It does this with the food it uses. All day long active boys and girls *wear out their nerves and muscles,* and this causes sound sleep during which repair takes place faster than wear, and worn-out tissues are built up

again. Furthermore, the body can add to itself, for we see the child grow to the stature of a man or a woman.

THE CLASSES OF FOODS AND THEIR USES IN THE BODY

If you were asked to state what kinds of food are consumed in America, you could write a very long list. In all this variety there is, however, a great sameness. Chemists have analyzed the foods and found that they contain only five kinds of substances or *classes of foods.* This fact is very plainly shown in the tables of food composition.

The Three Chief Classes of Foods. Everyone knows that potatoes, molasses, butter, and lean meat are very different; and that potatoes and rice are more alike than potatoes and butter. Potatoes and rice are both known as starchy food; molasses contains chiefly sugar; butter consists of fat; and lean meat is chiefly composed of a substance called *protein.* We have here, then, three classes of foods: (1) sugar and starch, together classed as the *carbohydrates;** (2) *fats;* and (3) *proteins.*

Almost any food we may purchase is a mixture of two or all three of these classes. Sugar, olive oil, and lard are exceptions. Starch is found with proteins or fats, or with both. From the tables showing the composition of the various foods (see pages 84, 89, 116, 127, 136, 147, 222, and 235), find out what, besides starch, is found in corn, wheat, almonds, and beans. Find out what classes of foods occur with proteins in peas, pecans, meat, and fish. Mention three foods that are largely fat.

Uses of the Three Chief Classes of Foods. We have seen that food is needed in the body for warmth, for work, for growth, and for repair. We may state this still more simply by saying that we need *energy foods* and *building foods,* for heat and work are simply two forms of energy, and growth and repair are the result of building up the tissues. The question now is, which of the three classes of foods mentioned are energy foods and which are building foods. Carbohydrates, fats,

* Sugar and starch are classed together as carbohydrates because they are chemically much alike (See pages 116 and 235) and because their use in the body is identical, since the starch is changed to sugar by the process of digestion.

and proteins all furnish energy, since they can all be used as "fuel" in the body. In this respect fats give the most energy, one pound of fat yielding more than twice as much as a pound of carbohydrates or protein.

Proteins,* however, differ from carbohydrates and fats in that they serve other needs in the body. They are the only class of foods that can be used for growth and repair. We shall, therefore, use the term *building foods* in further references to this class of foods. Since the carbohydrates and fats can serve only as the source of heat energy and energy for work, we may refer to these two classes of foods as *energy foods.*†

Mineral Foods and Water. To the carbohydrates, fats, and proteins must be added a fourth class, *minerals,* and a fifth class, *water.* Neither of these latter can furnish energy nor are they of use for growth or repair, but they are absolutely necessary for the health of the body. Of the minerals, table salt is the only one that must be added to our food, the others being present in sufficient quantities in a varied and well-balanced diet in which fruits and vegetables play an important part. Water dissolves food and waste substance in the body, and should be consumed in considerable quantities daily.

OUTLINE OF CLASSES OF FOODS

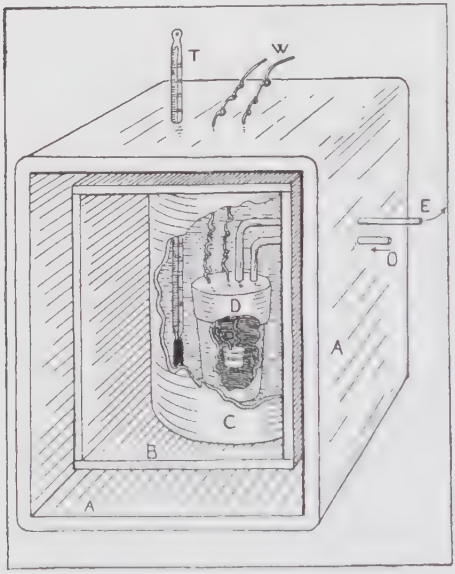
- I. Energy Producing Foods
  - A. The Energy Foods (In strict sense)
    - 1. Carbohydrates (Starch and Sugar)
    - 2. Fats
  - B. The Building Foods
    - 3. Proteins
- II. Non-Energy Producing Foods
  - 4. Minerals
  - 5. Water

* It has been thought inadvisable to make further distinctions here between the carbonaceous foods (those containing only carbon, hydrogen, and oxygen, namely the carbohydrates and fats) and the nitrogenous foods (those containing nitrogen and other elements in addition to carbon, hydrogen, and oxygen, namely the proteins and the albuminoids).

† The albuminoids, of which gelatin is the common example, have not been here considered. It should, perhaps, be explained to the pupil at this point that, while in chemical composition gelatin is similar to proteins, it cannot replace them, and it acts merely as "energy food" and not at all as a building food. The pupil is thus prevented from falling into erroneous notions as to the food value of gelatin.

THE FUEL VALUE OF FOOD

How Fuel Value is Determined. By fuel value of food is meant the amount of energy (heat and work) which a given quantity of food will produce. As the fuel value of coal is measured, for the sake of convenience, in terms of the heat it will produce, so the fuel value of food has been determined for all the common foods in terms of heat value, as can be seen from the tables of this book. The diagram shows an apparatus for measuring the fuel value of food. A weighed quantity of the food to be tested is placed in a crucible inside the closed vessel *D*. Electric wires *W* are placed in contact with the food so that it may be burned by means of an electric current. The vessel *D* is supplied with oxygen through the tube *O*, and is surrounded by a measured quantity of water within vessel *C*. *A* and *B* are larger vessels to prevent loss of heat. The temperature of the water in *C* is read on the thermometer *T*. From the weight of the food, the quantity of the water, and the increase of temperature of the water due to the burning of the food, the "fuel value" of the food may be calculated.



Standard of Measurement of Heat Value. The temperature of the water, however, is not the same as the amount of heat in the water. Two liters of water would contain twice as

much heat as one liter at the same temperature. The unit of temperature is a degree; the unit of heat is a *Calorie* (from the Latin, *calor*= heat). A Calorie is the amount of heat necessary to raise one liter of water one degree Centigrade.

If, for example, in the experiment above, an ounce of food was found to raise the temperature of a liter of water forty degrees, we should say that an ounce of that particular food has a fuel value of forty Calories; or a pound (16 ounces) has 640 Calories. The tables on food composition give the fuel value in Calories for each pound of some of the common foods.

Daily Fuel Value Requirements. The quantity of food required each day varies chiefly with the amount of exercise taken. It has been estimated that a grown person resting in bed needs sufficient daily food to furnish about 2000 Calories of heat. The energy requirement may rise to 5000 or more for a man doing hard manual labor. The average man requires food yielding about 3000 Calories of heat daily. About four-sevenths of this should come from carbohydrates; a little more than two-sevenths from fats, and a little less than one-seventh from proteins. The table on page 278 gives the quantities of common foods necessary to furnish 100 Calories of heat. From this it is easy to calculate a ration for a day or for one of the three daily meals.

CHEMICAL EXPERIMENTS

The following experiments will prove of interest and should be performed in the laboratory. The tests given are the usual color tests for starch, protein, and reducing sugar. It is particularly important that the tests be applied in Experiments VIII and IX.

EXPERIMENT I. *To test for starch.* Place a drop of iodine solution on starch paste (a teaspoonful of starch boiled in a cup of water). If the paste is thick, the color will be an intense blue, almost black. Dilute the paste until the color is a bright blue.

There are four principal kinds of sugar* that concern us in the study of the common sugars: *cane sugar*, which is the common granulated sugar; *grape sugar*, or glucose, found in grapes, but commercially manufactured from cornstarch; *milk sugar*, in milk; and *malt sugar*, in fermenting grains, especially barley, but also found in the mouth as a result of the digestion of starch.

The test here used is known as Trommer's test.† Prepare a 5% solution of caustic soda and a 10% solution of copper sulphate. Keep these in separate bottles until ready for use. To perform the test, take about half an inch of the copper solution in a test tube and add about the same quantity of caustic soda, or add this until a bright blue and almost clear solution results. Add the sugar solution to be tested and heat the mixture. If grape, malt, or milk sugar is present in the solution, the mixture will turn first yellowish, then red. These three sugars are known as "reducing sugars." No such effect is produced by cane sugar or by starch. Test them also and compare with a test made by heating Trommer's solution.

EXPERIMENT II. *Test for grape sugar.* Take some cheap stick candy or grind up some raisins and make a solution of either. Filter. Perform Trommer's test on filtrate.

EXPERIMENT III. *To change cane sugar to a reducing sugar.* Make a solution of cane sugar. Add a few drops of hydrochloric acid to the solution and boil. Neutralize with NaOH and make Trommer's test. Reducing sugar is found to have resulted.

EXPERIMENT IV. *To test for cane sugar.* If the food to be tested is sweet or a sugar is thought to be present, make a solution and filter. Test the filtrate. If no reduction takes place, the sugar, if any, is cane sugar. Add a few drops of hydrochloric acid and boil. Neutralize with NaOH and perform Trommer's test. The cane sugar, if present, has been changed in part to grape sugar.

EXPERIMENT V. *To change starch to grape sugar.* Place a little starch paste in a test tube, add a quantity of acid, and boil ten or fifteen minutes. Note how the mixture clears up, which indicates that the starch is changed to some soluble substance. Neutralize with NaOH and make Trommer's test.‡

* We shall not here discuss methods of distinguishing the reducing sugars from one another. If a sugar occurs in food, it is almost certain to be either cane sugar or grape sugar, except in the special cases of fermenting grain, which would have malt sugar, and milk, which contains milk sugar.

† The teacher may refer to any advanced text on the subject for the formula of Fehling's solution, which gives a better test.

‡ This experiment illustrates how the grape sugar of commerce is manufactured from cornstarch.

EXPERIMENT VI. *Two tests for proteins.** *(a) The "violet color" test for protein.* Shake up the beaten white of an egg (almost pure protein) in 100 c.c. (3½ oz.) of water. Place a little of the mixture in a test tube, add ten drops of caustic soda solution; then drop by drop add a little copper sulphate, shaking after each drop and noting the color changes. The violet color after several drops indicates protein.

(b) The "orange color" test for protein. Add several drops of strong nitric acid to a quantity of the egg white solution as prepared in (a). A white precipitate occurs. Boil. The precipitate becomes yellow. Cool the test tube and add ammonia; the orange color resulting indicates protein.

EXPERIMENT VII. *To test for fats (roughly).* A large quantity of fat or oil in a food, can, of course be recognized easily. A rough test for small quantities is as follows: mash the food to be tested in pure chloroform or ether. (If ether is used, beware of the flame.) Filter the liquid and place a drop on a clean white sheet of paper. If a grease spot is left after the chloroform or ether evaporates, the food contains fat.

EXPERIMENT VIII. *Food Analysis.* With the tests described above, analyze the foods your teacher gives you for sugar, starch, protein, and fats. Test onions, meat, liver, and milk. Test wheat flour in the following manner: make a small quantity of stiff dough. Take two tablespoonfuls and lay one aside for comparison later. Place the other in a sack of cheesecloth, and in a tumbler of water wash out all the starch possible, squeezing the rag vigorously and changing the wash-water occasionally. The *gluten,* a protein, is left in the rag as a sticky mass. Test this. Compare the quantity of gluten with that of the original spoonful of dough. What is the approximate proportion of protein to starch in wheat flour?

EXPERIMENT IX. *To show the change of starch to sugar in the mouth.* Test a cracker to be sure that the specimen contains no sugar to start with. Chew a cracker for as long a time as possible without swallowing. Then place the resulting milky mixture of cracker and saliva in a test tube and test for sugar, using Trommer's or Fehling's test. (The saliva may be added to a quantity of starch paste in a test tube kept at body temperature for half an hour and then tested.)

EXPERIMENT X. *To show the digestion of protein. (a)* First, make an artificial gastric juice in the following manner: to 100 c.c. of distilled water add ¾ of 1 c.c. of strong hydrochloric acid. This makes a ¾% solution. To this add a teaspoonful of pepsin.

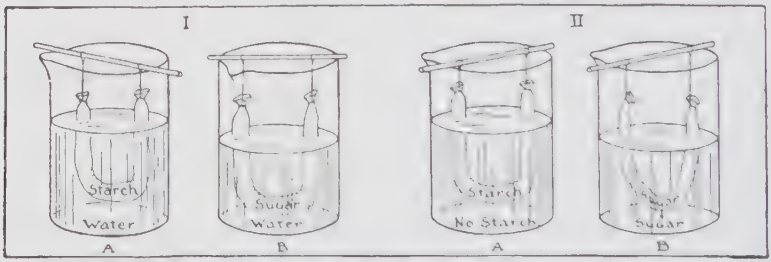
(b) Prepare several tubes of solid egg-white. To do this place in a test tube several small glass tubes about half an inch long. A pipette or eye-dropper, broken into short lengths, will do. Over the tubes pour the beaten white of an egg. Be sure the glass tubes become filled with egg-white. Now

* The first test is best for proteins partly dissolved in liquids; the second, for solid proteins.

coagulate or harden the egg white by setting the test tube in hot water. When the egg-white is hardened, remove the glass tubes, for example, by breaking the test tube. Clean off the glass tubes on the outside and place them in a beaker of artificial gastric juice and set them in a warm place until most or all of the solid egg-white has been dissolved (digested) out of the tubes.

DIGESTION DEFINED AND ILLUSTRATED

Why Food Must Be Digested. To prepare the food for absorption into the blood is the object of digestion. The following experiment will make the need of digestion clear.



EXPERIMENT XI. Two sacks or tubes of a membrane such as parchment paper or the bladder of a pig are filled, one with starch paste and the other with grape sugar solution. The tubes are hung in vessels containing pure water. A test made of the water in the vessels after three or four hours (see II in the diagram) discloses the fact that the sugar was able to pass through the membrane and that the starch was unable to do so. The reason is that starch is insoluble and that sugar is soluble. Thus all foodstuffs must be changed from an insoluble form to one that will pass readily through a membrane. The membrane through which the foods must pass to get into the blood is the wall of the alimentary canal.

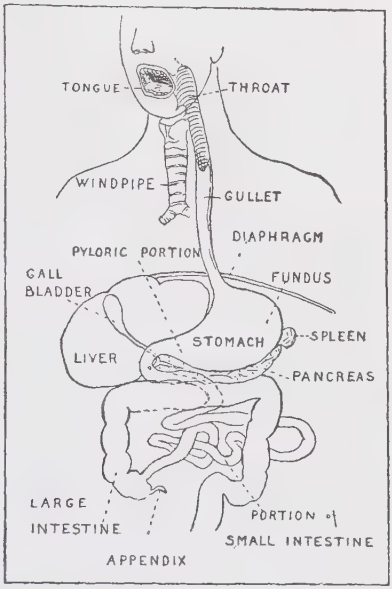
In the experiment just described the parchment tubes represent the alimentary canal and the surrounding water the blood. Digestion, then, consists of changing food into a form that will pass through the wall of the intestine into the blood. In other words, digestion prepares for absorption.

THE DIGESTIVE ORGANS*

The digestive organs consist of the parts of the alimentary canal and certain glands in connection with them. The parts

* Only a general and brief description is here attempted. The student is referred to textbooks on physiology for a detailed discussion.

of the alimentary canal are mouth, throat or pharynx, gullet or esophagus, stomach, small intestine, and large intestine. Digestion is carried on mainly in the mouth, the stomach, and the small intestine. The most important chemical changes occur in the small intestine, and it is mainly here that the food is absorbed by the blood.



The Muscular Wall of the Alimentary Canal. The gullet, stomach, and intestines are simply tubes of muscle lined with mucous membrane. The muscle fibers are arranged in two layers: the inner and thicker layer has the fibers running in rings around the tube; in the thinner outer layer the fibers run lengthwise. The muscle layers, especially the circular ones, are responsible for the various movements of the alimentary canal by which the food is moved on and is mixed with the various digestive juices.

The Glands of the Stomach and Intestines; the Villi. The parts of the alimentary canal differ in diameter, length, thickness of wall, and especially in the character of the lining. This consists of the mucous membrane, a smooth tissue only one cell thick in the stomach and the intestines, but thicker in the gullet. The inner lining of the gullet is smooth, but that of the stomach is interrupted by very numerous tiny pits or depressions, the *gastric glands*. These glands pour a juice upon the inner surface of the stomach just as the sweat glands pour sweat from the pores of the skin. Similar pit-like glands (called *intestinal glands*) are found in the small intestine. In addition

to these depressions the small intestine has innumerable *villi*, tiny projections so numerous as to give the inner surface a velvety appearance, as one may easily observe by viewing a portion of the intestine of a dog or a cat under a hand lens. The villi are, we might say, tiny tongues that suck up the digested foods. They contain the fine blood tubes or capillaries that absorb the foods from the intestine. Thus, the gullet has a smooth lining, the stomach has thousands of pockets or glands in its inner wall, and the small intestine has both glands and villi.

Other Glands. Besides the gastric glands, which secrete gastric juice, and the intestinal glands, which secrete intestinal juice, there are glands outside the alimentary canal which communicate with it by a duct or ducts. These glands are the salivary glands, secreting saliva; the liver, secreting bile; and the pancreas, secreting pancreatic juice. The three pairs of salivary glands empty their secretion into the mouth; the pancreas and liver pour their secretions together into the small intestine.

Thus the mouth receives saliva, the stomach receives gastric juice, and the small intestine receives intestinal juice, pancreatic juice, and bile. All these juices have special work to do in digestion.

HOW AND WHERE DIGESTION TAKES PLACE

In Experiments V and IX above, starch was changed to sugar by two different means: by acid and heat (Experiment V), and by saliva (Experiment IX). The change by saliva is called digestion, and is performed in the body by a digestive juice. No high heat is required, and in the mouth there is no acid. What, then, causes the change of starch to sugar? In the digestive juices mentioned there are substances called *enzymes* that have the power of producing chemical changes without themselves being destroyed in those changes. Just as a match may be used to set off a train of gunpowder, so the enzymes, slowly, however, cause the foods to be digested. Thus starch is changed to malt sugar and malt sugar in turn to grape sugar. Proteins

and fats, also, are digested (See Experiment X above) and changed to soluble substances that are able to pass through the wall of the intestine into the blood. The following table is here given for review and for further reference:

Organ	Glands	Juices	Enzymes	Chemical Action
Mouth	Salivary	Saliva	Amylase	Starch to Malt Sugar
Stomach	Gastric	Gastric	Pepsin Rennin	Proteins to Peptones Curdles Milk
	Intestinal	Intestinal	"Inverting"	Cane sugar, Milk sugar, Malt sugar } to grape sugar
			Erepsin	
Small Intestines	Pancreas	Pancreatic	Amylase	Starch to malt sugar
			Trypsin	Proteins to peptones, etc.
			Lipase	Digests fat
	Liver	Bile	None	Helps other juices

Notes on the table. It is seen from the table that fats and the sugars are digested only in the small intestine. Here also the digestion of the carbohydrates and proteins is completed.

Starch is digested to malt sugar partly by saliva and partly by the pancreatic juice.

Protein digestion is begun in the stomach (by gastric juice) and completed in the intestine (by pancreatic and intestinal juices).

Pancreatic juice is capable of digesting fat, starch, and proteins.

Very little food is absorbed before it reaches the small intestine.

Grape sugar seems to be the only common food (except minerals) not needing digestion.*

Summary. Foods must be digested, that is, made soluble and capable of passing through the wall of the intestine into the blood. The chewing and moistening of the food in the mouth prepare it for chemical digestion by the enzymes of the digestive juices.

* In spite of this fact, for various reasons, grape sugar is not a desirable sugar for general consumption; cane sugar is *much to be preferred.*

CONTROL OF THE DIGESTIVE ORGANS

Movements of the Alimentary Canal. (1) *Chewing.* Chewing is of extreme importance; first, for breaking up the food so that the digestive juices may attack it; second, for stimulating the salivary glands.

(2) *Movements of the Stomach.* The stomach consists of two parts, especially with respect to its movement. The large end or fundus of the stomach (See the figure on page 47) merely stores the food, holding it in place with a slight contraction, which is almost continuous. The food, after being chewed and swallowed, lies in the fundus of the stomach for an hour or more before being mixed with gastric juice. The saliva is thus able to continue its action upon the starch for some time after the food reaches the stomach.

The pyloric half of the stomach undergoes movements which serve to push the food, a little at a time, toward the small intestine and to mix it with gastric juice. The ring muscles of the stomach contract in waves, which begin in the middle and pass slowly toward the intestine. This movement is called peristalsis. When a small part of the food is sufficiently acid, the pylorus opens and the food passes on into the intestine.

The action of the stomach is controlled in part by nerves. Anger, fear, and worry interfere with the movements of the stomach; in fact, sudden fright may stop its action entirely. One should not eat a hearty meal, therefore, when under a nervous strain.

(3) *Movements of the Small Intestine.* The small intestine has at least two movements, one being peristalsis, which moves the food gently on. The other movement is a rhythmic contraction, not in successive waves, and its effect is to mix the food more thoroughly with the juices. These movements are also under control of nerves and are subject to the effects of fear, anger, worry, and other unfavorable states of mind. For proper digestion, therefore, meal-time should be as pleasant as possible.

Summary. The stomach consists of an enlarged end on the

left side, the fundus, and a pyloric end on the right side. The food is stored for some time after a meal in the fundus, which does not undergo peristaltic movement. The food is mixed only in the pyloric end. The small intestine has two movements: a peristaltic or wave-like movement, by which the food is gently pushed on, and a rhythmic movement, by which the food is thoroughly mixed. Anger, fear, and worry interfere with these normal movements.

The Secretion of the Appetite Juices. (1) *Saliva.* Saliva has been called an appetite juice. It flows very freely while there is food in the mouth and especially while the food is being chewed. Saliva will flow appreciably even when we smell or think of food, flowing most freely when we are conscious of an agreeable taste. A meal tastefully prepared and deliciously flavored is conducive to health, as it stimulates the flow of the appetite juices. When the meal is over and chewing the food is at an end, the free flow of saliva stops. It is therefore well, in order to secure a thorough mixing of the food with saliva, to chew all the food to a thin pulp. The importance of this is particularly apparent when we consider that digestion by saliva continues for some time in the fundus of the stomach, as was stated above. When the glands form or *secrete* the digestive juice for a considerable time, the saliva becomes poorer and poorer in enzymes; that is, the juice becomes less powerful in its ability to digest starch. The continual chewing of gum or eating between meals, therefore, weakens the digestive power of the saliva for the regular meal.

(2) *The Gastric Juice.* The gastric juice is also an appetite juice, for it is made to flow during the smelling, tasting, and chewing of food. Its flow, also, is diminished by unpleasant and stimulated by pleasant states of mind. There is a good reason for the saying, "A laugh is the best of sauces."

The gastric juice must, however, continue to flow several hours after the meal. That its secretion may continue, there must be present in the stomach certain substances to stimulate the glands, since the nerves no longer act. Beef broth, *dextrin,*

and *peptones* are among the substances that have this effect. The custom of beginning the meal with beef soup is therefore a good one. Since *dextrin* is present whenever starch begins to be digested, we have here an additional reason why food should be thoroughly chewed. *Peptones* are present in the stomach when the digestion of proteins begins; therefore, proteins should form a part of each meal.

THE HYGIENE OF DIGESTION

In the preceding paragraphs the effect of the state of mind on the flow of the appetite juices and on the movements of the stomach and small intestines has been pointed out. In this section some further health rules are added.

Cleanliness of Food. One of the first qualities of attractiveness of food is cleanliness. Food should be clean, not merely in appearance, but clean with respect to harmful bacteria. Every householder should consider carefully the subject of clean milk, bread, and meat, and clean kitchens.

Quantity of Food. The quantity of food required varies with the individual constitution, the climate, and the occupation. As already stated, if much work is done there must be a plentiful supply of fuel with which to do it. Again, in winter we exercise more than in other seasons; therefore, in winter we need more food. In general the appetite is a good guide; if people ate only when they were really hungry they would improve their health.

The Balanced Ration. (1) *Meaning.* A general term for balanced ration is mixed diet. Both expressions imply that our diet should consist of a variety of food. Everybody knows in a general way that it is desirable to vary his food from meal to meal and from day to day. Our tastes, too, tell us that it is not well to try to live on a very limited bill-of-fare. A balanced ration is one that furnishes the right proportion of building foods (protein) to energy foods (carbohydrates and fats). The proportion of carbohydrates to fats is not so important as the proportion of proteins to the energy foods.

(2) *Why We Cannot Live on Proteins Alone.* In the early

part of the chapter it was stated that protein furnishes heat as well as building material. Why, then, do we not live on protein or building foods alone?

In the first place, the building foods are the most expensive of the foods, as, for example, meat, eggs, poultry, fish, milk, and cheese, all of which are rich in building foods. The energy foods, especially those of a starchy nature, are the cheapest.

Secondly, our appetites would react against eating proteins only, day in and day out. This is simply Nature's way of saying that such a one-sided diet is not good for us.

The third and strongest argument against an excessively protein diet is its injuriousness. It is injurious because proteins, when burned in the body, leave waste matter that is hard for the kidneys to remove. Starch, sugar, and fat, the energy foods, "burn clean" in the body, forming carbon dioxide, which is thrown off from the lungs, and water, which is not harmful. But the building foods form much "ash" or waste substance which the kidneys have to eliminate. Thus an excess of proteins in the diet would overtax the kidneys.

Besides these reasons, it may be stated that practically all the protein eaten is used up in the body at once, whereas excess of the energy foods is stored up in the body in the form of fat.

(3) *How Much Protein Should Be Consumed?* The authorities are not in perfect agreement as to just what the proportion of building to energy foods should be. Perhaps one-seventh of the total solids eaten, or 100 grams* of dry proteins furnishing 410 Calories, would represent a conservative proportion for a person using 2500 total Calories daily, though some authorities recommend a greater proportion of protein. It is certain, however, that it is desirable for growing children to consume a little more protein than the amount needed for repairing their tissues, since they must also add to their weight and stature. Grown persons will do well to consume a smaller proportion of building food; the rest of the diet should be made up

* 1 gram protein furnishes about 4.1 Calories.
1 gram carbohydrate furnishes about 4.1 Calories.
1 gram fat furnishes about 9.3 Calories.

from the energy foods. One hundred and twenty-five grams of protein is furnished by the following daily rations (given in ounces):

(1) Beef (round), 13; butter, 3; potatoes, 6; bread, 22.
(2) Pork (salt), 4; butter, 2; beans, 16; bread, 8.
(3) Beef (neck), 10; butter, 1; milk (1 pt.), 16; potatoes, 16; oatmeal, 4; bread, 16; sugar, 3.

In case of hard physical labor the diet must be increased principally by adding energy foods.

Coarse Foods. The average diet for the healthy individual should not consist merely of concentrated, highly nutritious, and easily digestible foods. On the contrary, the food should have some bulk; it should contain some coarse material. This is another argument for making the diet largely vegetable, since vegetable foods contain considerable indigestible *cellulose* or woody substances. Coarse foods are, moreover, good for the teeth because these tend to be more sound when stimulated by the work of chewing coarse foods. Again, such foods are of advantage in requiring the individual to chew the food a long time and mix it thoroughly with saliva. And, lastly, a certain amount of coarse food stimulates the peristaltic movement of stomach and intestines, thus helping to prevent constipation.

Why Food Is Cooked. One of the great objects of cooking food is to sterilize it, that is, to kill any harmful germs of disease that it may have gathered through careless handling on its way to the consumer or that may be in the food originally. To the latter class belong trichina in pork, tapeworm in pork and beef, and tuberculosis in milk and meats. Another purpose of cooking is to make the food more digestible. In the case of meats, heating dissolves the tough connective tissues, changing the fibers to gelatine. Some vegetable foods, such as grains, *legumes*, (peas, beans, and peanuts) and potatoes, are very indigestible when raw because the starch and proteins are encased in the indigestible cellulose walls of the plant cells. Cooking breaks up these cells and the starch and protein grains, thus allowing

the digestive juices to get to the food substances to digest them. Cooking also develops flavor, a most important factor in the digestion of food.

Fried Foods. Frying is an unhygienic method of cooking. The grease penetrates the mass of food and surrounds its particles to such an extent that the digestive juices cannot get at the food particles to digest them until the fat has first been digested. As fat is digested only in the intestine, the digestion of the grease-soaked foods is delayed until after its passage through the stomach. It is, of course, quite possible to fry meat in such a manner that only a small portion of it becomes saturated with grease; but this is impossible in the frying of cereal foods.

Relation of Diet to the Kidneys. The kidneys remove from the blood not only protein wastes, but also other solids such as acids, salts, or even sugar, if present in large quantities. Avoid an excess of protein or sugar, since too much sugar causes the kidneys to eliminate sugar from the blood. Any ordinary quantity of sugar consumed is stored by the liver, but when the quantity is too great the liver cannot take care of the excess, and the result is an overloading of the blood with sugar. Much spices and condiments, such as pepper, mustard, and horseradish, also are injurious to the kidneys on account of the irritating action on the kidney cells. Table salt in excess also is injurious and should be avoided. The heating of fats to a high degree causes them to break up into irritating fatty acids, injurious to the digestive organs and the kidneys.

QUESTIONS AND PROBLEMS

Explain the uses of food in the body. Compare the body with a stove. With an engine. Wherein does the body differ from either? Distinguish between classes of foods and kinds of foods. Name twenty kinds of food. Name the five classes of foods and state the uses of each in the body. What purpose can all of the three chief classes of foods serve in the body, and why? Why do we term carbohydrates and fats the energy foods? For what purpose are proteins *only* used?

Define fuel value of food. How can the fuel value of food be determined? Define Calories. Consult the proper tables on food values in this book and mention six foods poor in fuel value and six foods rich in fuel value. Show how the fuel value of a meal may be calculated.

Describe appropriate tests by which you can show that cake contains protein, starch, fat, and cane sugar.

Define digestion and show why food must be digested. Where are the gastric glands? The intestinal glands? The villi? Compare the inner surface of gullet, stomach, and small intestine. Name the digestive glands and the juices produced by them. State the function of each digestive juice. Where do digestion and absorption chiefly take place?

Describe the movements of the stomach and of the small intestines during digestion. How may these movements be interfered with? What are the appetite juices and why are they so called? What may interfere with the proper secretion of these juices? What substances present in the stomach cause a continual secretion of gastric juice?

What is meant by the proverb, "A laugh is the best of sauces"? What is the hygienic value of appetizing appearance of food? Discuss the cleanliness of food. What is the main factor in determining the quantity of food which it is best to eat? Define balanced ration and give arguments in its favor. Make out several daily balanced rations, using the tables on food composition in this book. What is the hygienic value of coarse foods? Why is fried food unwholesome? What is the chief reason for cooking meats? For cooking vegetables? What are the harmful effects of eating excessive amounts of protein? Of sugar? Of salts and condiments?

THE YOUNG HOUSEKEEPER

CHAPTER II

GENERAL RULES FOR THE KITCHEN

CARE OF EQUIPMENT

Preparing Dishes for Washing. Scrape the food from the plates and other dishes and wipe them with a bit of soft paper or a rubber dish scraper; pile dishes of one kind together; wipe grease from knives, forks, and spoons with a paper. Place silver in one pile, steel knives in another. Rinse sugar from cups with a little hot water.

Soaking Dishes. Soak dishes that are sugary or that have had gummy substances such as gelatin on them, in hot water; dishes that have been used for milk, eggs, or starch in cold water. Never put cold water into hot earthenware dishes.

Dish Water. Fill the dish pan half full of hot water, and put in the dishcloth and a piece of white soap. A soap shaker will be found a great convenience. Wash the dishes, using a hand mop or a cloth on a fork. Put the hands in the water as little as possible. Fill another pan with clean hot water and rinse the dishes in it as soon as they are washed; put them in a draining pan or rack, and dry with a clean soft towel; or put the dishes in a pan or rack and scald; then dry. Do not scald delicate china.

Order of Work. 1. *Glassware.* Put the glasses into the water sidewise, dipping them so that the whole glass will be covered at once, for if one side is heated before another, unequal expansion will result and cause them to break. Glassware and silver will be brighter if wiped from clean suds without being rinsed. Always use a dry towel free from lint. Cut glass should never be put into hot water.

2. *Silver.* Do not put ivory or bone handles into water.

3. *China.* Cups, saucers, plates, platters, and vegetable dishes.

4. *Kitchen Utensils.* If necessary, use one of the commercial cleansing preparations on a cork for rough places. Clean seams in kitchen utensils with the dishcloth on a wooden skewer. Wash small utensils. Do not put the wheel of the dover egg beater in water. Kitchen utensils may be washed first, if so desired.

5. *Coffee Pots and Teapots.* Take clean, fresh hot water for coffee pots and teapots. Clean the spouts carefully, dry thoroughly, and leave the lids open so that they may air.

6. *Milk Vessels.* Rinse milk vessels in cold water, wash in clean soap suds, rinse, scald well with boiling water, then air. Milk bottles should not be scalded, but they may be covered with cold water and brought to the boiling point. Before boiling put a cloth under them.

Polishing Knives and Forks. For steel knives use the special brick or tripoli. Dampen a cork, dip it in the polishing material, then rub the knife blade briskly on both sides; wash in soapy water and dry. If tripoli is used rub the knives dry with a soft cloth, but do not wash them.

Cleaning Silver. Silver may be cleaned with fine whiting or silver polish. Put the powder on a damp cloth, rub the article to be cleaned well, then rub with a dry cloth and polish with a chamois skin. Use a soft brush to clean ornamental work on silverware. Rub spoons tarnished by egg with salt, then wash in water to which ammonia has been added.

Silver may be cleaned by using the solution given below:

1 quart water	4 tablespoonfuls of bicarbonate of soda
2 tablespoonfuls salt	a piece of zinc

Use an aluminum pan. Secure a piece of zinc of a size to suit the pan you wish to use. A piece from an old stove board will do. Put it into the pan and add enough of the solution given above to cover the silver, which has been previously washed. Be

sure that the silver touches the zinc or some other piece of silver that is in contact with it. Let it stand until the black portions of the silver have turned white (from one minute to one hour may be required), then remove, rinse well, and dry.

Metal Utensils. Wash all utensils with a mild soap suds, rinse, and dry thoroughly. If the inside of aluminum utensils becomes dark, clean with lemon juice and salt. Do not scrape aluminum with a knife or other sharp instrument, but use a wooden spoon or a clothespin. Do not clean it with soda, ashes, lye, ammonia, washing powder, or a strong soap, as strong alkalies tarnish aluminum. Keep both inside and outside clean. Handle enameled ware as though it were glass, to avoid chipping. Utensils of iron or steel should be coated with vaseline if not in constant use.

The Bread-Board and Rolling-Pin. Scrape all dough and flour off, but do not cut the wood. Clean with cold water, using a small scrubbing brush. Dry well. Scald occasionally, but do not let the boards stand in water, as this softens the wood.

The Refrigerator. Keep the refrigerator clean. Wipe the ice with a clean damp cloth before it is put into the box. Do not wrap ice in paper. Never put any dirty articles such as peach or grape boxes, or food with dust on it, into the refrigerator. Anything that is spilled in the chest should be wiped up immediately.

Keep special dishes as food receptacles for the refrigerator.

Wipe the inside of the box and the shelves and doors with a dry, clean cloth every day.

Once a week wash and scald the shelves, and wipe the inside of the box with a cloth wrung out of a soda solution, then with a clean, damp cloth, and dry with a clean cloth.

The drain pipe catches dust on its damp surface and molds or bacteria may lodge there, so it should be well cleaned with a brush or a cloth on a wire. Scald it with the soda solution once a week. Clean the drain pan the same way. The slime that forms in the pan is the result of bacterial growth. *Never connect the drain from the ice-box with the sewers.*

Dish Towels. Wash the dish towels and cloths with warm water and soap, rinse in warm water, and dry outside in the sun if the flies cannot reach them there, or hang in a current of air in the kitchen. Pour boiling water over them very often and wash and boil them at least once a week.

Wooden Drain Boards and Tables. Wipe off the crumbs, then wash well, using a cloth, a good cleanser, and a small scrubbing brush. Scrub the board with the grain of the wood. Rinse well, then dry promptly. Scrub wooden tables in the same way.

The Sink. As soon as the dishes have been washed, clean every part of the sink with hot, soapy water, using a skewer and a piece of cloth to cleanse the cracks. Scald and dry thoroughly. Then wipe and dry the faucets. Once a day pour a kettle of boiling water through the drain, and once a week pour through it two quarts of boiling water to which has been added half a cup of washing soda. If much grease has been allowed to run down the sink, scald it with a gallon of boiling lye solution (1 lb. concentrated lye to 5 gal. water).

The Garbage Pail. Use a strong metal pail with a close fitting cover. Drain all garbage before putting it into the pail. Keep the garbage pail clean by washing it once a week with a hot soda solution, then airing it, and drying it thoroughly. A dirty garbage pail attracts flies and other insects in great numbers. If the rules of the sanitary department of your city permit, line the bottom and sides of the garbage pail with several folds of newspapers, to lessen the labor in cleaning.

DIRECTIONS FOR MEASURING

Exact measurements are necessary for successful cooking. The regular measuring cup holds half a pint, and is marked in thirds, fourths, and halves. It is well to have a tin or aluminum cup and one of glass. Use the metal cup for anything that is hot. Teaspoons and tablespoons of regulation size are used in measuring. *All measurements in this book are level.*

All dry materials must be stirred or shaken before they are

measured. Sift flour, meal, powdered sugar, confectioners' sugar, soda, and mustard, before measuring, then fill the cup by means of a spoon or scoop. Do not pack hard or shake down. Smooth the top with the back of a knife.

To measure butter, lard, or other solid fats, pack hard in the cup. If it is very firm, shave or cut it into small bits before measuring.

To measure spoonfuls of dry materials, dip the spoon in the material, lift it out, and smooth the top with the side of a knife. To measure half a spoonful, draw the knife through the center from the handle to the tip, pushing half the material off the side of the spoon. For a quarter of a spoonful divide the half spoonful in two, crosswise, marking a little nearer the handle than the center. For an eighth of a spoonful, mark diagonally across the quarter spoonful. Less than a sixteenth of a teaspoonful is called a few grains or a speck.

Small quantities of flavoring or other liquids are measured by drops. The number of drops in a spoonful depends on the thickness of the liquid. There are sixty drops in a teaspoonful of liquids such as vanilla extract. Drops from a thick lipped bottle are larger than from a thin lipped one. In measuring liquids pour into the measure all that it will hold.

TABLES OF MEASURES

Abbreviations

In recipes some words are shortened and for others letters only are used.

tsp.	stands for teaspoonful.	tbsp.	stands for tablespoonful.
sp.	stands for speck.	gr.	stands for grain.
oz.	stands for ounce.	c.	stands for cup.
pt.	stands for pint.	qt.	stands for quart.
min.	stands for minute.	hr.	stands for hour.

Equivalents

3 tsp. equal 1 tbsp.
2 gills equal 1 c.
4 c. equal 1 qt.
1 c. equals ½ pt.
2 pts. equal 1 qt.

EQUIVALENT WEIGHTS AND MEASURES

2 c. butter	equal 1 lb.
2¾ c. corn meal	equal 1 lb.
4⅓ c. rye meal	equal 1 lb.
4¾ c. rolled oats	equal 1 lb.
4 c. pastry flour	equal 1 lb.
4½ c. Graham flour	equal 1 lb.
3⅞ c. whole wheat flour	equal 1 lb.
2 c. finely chopped meat	equal 1 lb.
2 c. granulated sugar	equal 1 lb.
2¾ c. powdered sugar	equal 1 lb.
3½ c. confectioners' sugar	equal 1 lb.
2⅔ c. brown sugar	equal 1 lb.
2 tbsp. granulated sugar	equal 1 oz.
2 tbsp. butter	equal 1 oz.
4 tbsp. flour	equal 1 oz.
1 c. stale bread crumbs	equals 1 oz.

THE FIRE

Cooking is the application of heat to food. Food is cooked by exposure to heat by placing it directly over the fire, in the oven, in a pan over the flame, cooking in water, steam, or fat; or by heating very hot, then confining the heat, as in the fireless cooker. These processes have different names. Name and describe the ones you know.

Heat is produced in four ways: by the sun's rays, by friction, by electricity, and by burning or combustion.

In cooking we are concerned chiefly with heat produced by burning or combustion. Combustion is another word for the process of burning. In order to have fire, three things are necessary: first, something to burn, which is called fuel; second, heat enough to start the burning; and third, air to keep it burning. We have seen that air is necessary to life. The process going on in the body by which new tissue is built and wastes burned is really a process of combustion. Air is composed of two gases, oxygen and nitrogen; oxygen is the element that is necessary for combustion.

When burning goes on in the body or when fuel burns, waste

products are formed and thrown out. These are moisture, gases, and some solids. Carbon dioxide is one of the gases. Stoves are provided with flues for the escape of these substances.

Important Points in Managing Stoves. Two things are needed for success in managing stoves: first, the right quantity of air; second, the proper provision for carrying off the wastes formed. In wood and coal stoves the air is secured by means of dampers.

The Dampers. The chimney dampers are provided for the escape of air, vapors, and smoke, and should never be entirely closed, as disagreeable gases will then stay in the room. The oven damper turns the current of heat around the oven, instead of letting it enter the pipe directly. If you wish a quick, light fire, open the oven damper. The foot damper at the bottom lets air in to furnish oxygen for burning the fuel. When it is closed the fire burns slowly, with little heat. The check damper at the top of the stove sends a draft of cold air over the firebox, and checks the heat. Open it to cool the oven.

Laying a Wood Fire. Remove all the ashes from the firebox and from the top, just under the lids. Open the dampers. Put enough slightly twisted paper in the bottom to nearly cover the grate. Lay over this some kindling, putting it crosswise so that air may circulate. Over this place small pieces of wood, then a few larger pieces. Put on the stove lids and light the fire by applying a match to the paper through the front grate. When the wood has begun to burn well put in more, and when this burns close the oven damper. *Never use kerosene to start a fire. Many persons are burned to death in this way. Use only safety matches in your home. Many lives and much property are lost by the careless handling of matches. Keep matches out of the reach of little children. Most matches are poisonous.*

Regulating the Wood Stove. A good stove free from cracks and with a thick walled oven is needed if economy of fuel is desired. The flue must draw well. Place the stove out of drafts. Keep the ash pan clean. Remove the soot from below the oven, from the back, and from the pipe. Keep the space

under the lids free from ashes. Select dry, well-seasoned wood, as much of the heat from green wood is lost in drying it.

With any stove one must exercise judgment in regulating the temperature. If the oven is too hot put a pan of cold water in it, take the lids off, and open the pipe and oven dampers. If the heat at the bottom of the oven is too great, put in a sheet of asbestos, or support the pan on a rack. If a slow fire is needed, partly close the damper in the flue and the one below the firebox.

The Coal Stove. Lay the fire as directed, using enough crumpled paper to cover the grate well. When laying the wood be sure to have plenty at the ends as well as in the middle so that the coal will be kindled. Then put a little coal over the wood and light the fire. When the coal is burning well, add more coal, putting in a small quantity at a time. Too much coal at once will smother the fire and make it go out, or burn so slowly that little heat will be given off. *When coal burns quickly with plenty of air it uses a large quantity of oxygen and so gives intense heat, while if it smolders slowly in a parched mass, little oxygen is used and much fuel is wasted.*

Never fill the firebox so full that the coal is higher than the lining. For a steady fire, rake out ashes or give the grate a turn, if it is a revolving one, fill the firebox not more than two-thirds full, and open the lower front and the flue dampers so that a good draft is formed. When the lower coals are red and glowing and the top layer black, close the dampers. As soon as the top layers begin to get red, add more coal. To heat the oven, close all but the oven and chimney dampers. Study your dampers carefully and turn them as needed.

Much fuel is saved by keeping a continuous fire because the stove does not become cold and thus require rekindling. At night shake down the ashes, put on some fresh coal, and when the blue flame disappears close all the dampers. In the morning shake down the ashes, open the dampers to let the air in, and put on a little coal. If the fire is very low lay on a little kindling and light wood before you shake the ashes down, and when the coal is burning add more.

The Gas Stove. Examine your stove carefully and note the purpose of the different burners. Keep all cocks tightly closed when not in use. If there is any leakage turn off the gas at the main pipe when the stove is not in use. If the room seems filled with gas, air it well before lighting a match in it.

To Light the Gas. Turn the cock and let the gas run for two or three seconds, then light a match and apply it to the center of the burner, holding it slightly above the burner. If the proper amount of air is supplied, the flame will be blue; if insufficient air is admitted, the flame will be yellow; while if too much gas is admitted, the flame will be yellow and smoky. To light the oven, first open the oven door, then light the pilot, and turn on the burners. When they are burning clear and blue, turn off the pilot. If the gas burns yellow with a roaring noise, turn it off and relight after a few moments.

To Save Gas. Get the food ready to put over the fire before lighting the gas. As soon as the food is boiling lower the gas. Do not keep the teakettle boiling all the time. Turn off the heat when the water boils, and reheat it when necessary.

Use the simmering burner turned low for slow cooking.

Turn off the back burner of the oven when the oven is hot unless a high temperature is needed. Matches are always cheaper than gas.

The Blue Flame Oil Stove. In these stoves the oil is converted into gas which burns with a hot blue flame. At first the oil burns as it does in an ordinary lamp. It is not so hot or clean then as it is a few minutes later, when the gas is formed.

Be sure that the stove is level, that there is no draft over it, and that wicks and burners are kept clean. Rub the edge of wicks twice a week with a bit of paper or cloth. Fill the reservoir frequently, using oil of good quality. Clean the reservoir and pipe occasionally to remove sediment. When you wish to raise or lower the wick while the stove is burning, do it slowly, so as to avoid a sudden rush of oil that will cause the flame to flare. Keep the oil in a cool place away from the stove. *Never fill the stove near a lighted lamp. Keep a box of sand or a fire*

extinguisher near the stove, for while it is not dangerous if handled carefully, one should take no risks.

The Care of Stoves. Keep the burners clean and the air holes open. If anything spills on the stove, clean it at once. If the stove is kept clean and rubbed occasionally with a piece of flannel dipped in vaseline or an unsalted cooking fat, it will not require polishing. If polish is desired, apply when the stove is only slightly warm, for if it is too hot it cannot be made bright. Polish the part farthest away from the body first so as to avoid soiling the clothing.

Zinc discolors easily, so if water is spilled on it wipe it off immediately. Polish the zinc with silver polish or kerosene oil.

THE FIRELESS COOKER

A fireless cooker of a good make is a great saver of fuel and labor. The cooker must be well made, with closely fitting lids, and provided with tubes for the escape of steam. A stand fitted with rollers should be provided for the cooker. It should have a shelf on which the radiators may rest.

The Care of the Cooker. Wipe moisture out of the cooker as soon as food is removed from it. If anything is spilled on a radiator wipe it off immediately. Clean the cooker carefully with fresh, warm, soapy water, never using dish water or the ordinary dishcloth. Dry well and keep it open when not in use as very disagreeable odors arise if the cooker is kept closed or becomes dirty. It should be sunned occasionally. If the radiators become dirty, heat them very hot, keeping each side over the flame long enough to burn off any food on the surface.

If the radiators are kept in a damp or cold place, much fuel is needed to heat them and they are apt to crack. A shelf by the range or by a sunny window is a good place for them.

Heating the Radiators. The temperature of the radiators has much to do with success in fireless cooking; metal radiators heat more quickly but lose their heat sooner than those made of soapstone. The former retain their heat sufficiently to allow baking for one hour and a half, while the soapstone disks may

be made hot enough for baking for three hours. Heat leaves the cooker rapidly when the steam escape is left open; therefore, the heat will not be held as long when cooking roasts, baked potatoes, or other foods that require drying, as when cooking cereals or soups. A small amount of food in the cooker cools more quickly than a large amount. It also dries more quickly, so that there is danger of overcooking.

The time required for heating the radiators cannot be definitely fixed as the fuel used is variable, but the average time needed to heat them over gas for baking cakes, or for cooking stews or cereals is fifteen minutes; for roasting meats, cooking rice, or baking potatoes and food of this class, twenty minutes. The heat of the radiator should be tested each time. If a little flour sprinkled on the radiator turns to a golden brown, the radiator is hot enough for biscuits or cakes; if it turns to a very rich brown, it is hot enough for roasts or pies. If the flour does not brown, the radiator is not hot enough. Heavy white paper may be used for this test instead of flour.

In using the cooker, follow the general recipes of this text and cook as directed under the different chapters on cooking. Where long cooking is needed, as for hams, reheat the radiators after about three hours but do not heat as hot as at first since the food itself is now very hot.

A LIST OF RULES FOR THE KITCHEN

Necessary Equipment

An apron that comes down to the hem of the skirt and covers the sides well. It should have a bib to protect the front of the dress. Sleevelets if long sleeves are to be worn. Hand towel, half a yard long, with a loop to fasten it to apron. Cap if desired. Two holders, each six inches square.

Order of Work

1. Put on apron and sleevelets, pin the hair up neatly, and put on the cap if one is to be worn.

2. If a wood fire is used, start fire and put on teakettle. If gas is used, note time when burner must be lighted.

3. Wash hands carefully, using nail brush. Clean nails with fresh wooden toothpick.

4. Put large plate on table on which to place all small utensils used.

5. Read over recipe and select utensils needed.

6. Prepare pans or bowls if any are needed.

7. Measure materials; first, dry substance, then fats, then liquids.

8. Combine materials, following directions very carefully; put food on to cook.

9. Put away supplies and wash utensils used.

General Directions

1. Teakettles should be left empty and the lids removed when not in use.

2. The stove should be left as clean as knife and paper can make it. Never use dishcloth for cleaning stove. Be sure to leave stove dry so that it will not rust. Do not set anything on the stove when it is not in use.

3. Leave the table, utensils, and the bread and meat boards clean and dry.

4. After using a brush, wash it and leave brush side down to dry.

5. See that glass jars are wiped, and that covers are on securely before returning them to the closet or drawer.

6. Use care in opening and closing all drawers so that utensils may remain in place.

7. See that all utensils in the cabinet are hung on the proper hooks and placed on the shelves of cabinet in the order in which they belong.

8. See that portable oven is left clean and dry after being used and is replaced on proper hooks.

9. If water is spilled on the floor, wipe it up at once with floor cloth. Then rinse cloth and place on rack to dry.

10. Do not brush crumbs from table to floor. Before leaving the room brush up any crumbs or refuse on floor about the table.

11. Do not put water into the garbage pail.

12. Keep a special teaspoon to use when tasting food. Do not put this spoon in food that is being prepared.

13. Do not touch hair or face while cooking if it can be avoided. If it is necessary to use a handkerchief, wash the hands carefully after using it.

14. Do not blow on food to cool it.

15. In the school kitchen, return all dishes and utensils that do not belong in desks to the supply table; if any article is imperfect or cannot be cleaned, return it at once to the teacher.

QUESTIONS AND PROBLEMS

Study the fuel or fuels in your locality, according to the questions given below:

What is meant by combustion? Make a diagram of your stove, showing location of dampers. Give directions for laying fire in coal or wood stove. Give directions for selecting wood. How long does a cord of wood last your family? How much does it cost? What is the price per ton of coal? How much is needed a month for your family?

Tell how to light the gas burner. What is the price per thousand cubic feet of gas in your town? Read your gas meter and compute the cost for a month. (See directions on back of gas bill.) By experiments determine the time in which two cubic feet of gas are used with your burner at full pressure. Find the time in which two cubic feet of gas are used for simmering on same burner. Estimate gas used in heating fireless cooker radiator. Suggest some means by which fuel may be saved.

What would an oil stove cost in your community? What are some standard makes? How much would it save in comfort? How much oil is used in filling the reservoir of an oil stove? How much does it cost? Compare cost of oil and other fuel with which you are familiar. Where gas is used, compare cost and labor involved in use of oil and gas stoves.

Is electricity available for cooking purposes in your locality? Compare the cost with that of other fuels. Can special rates be had in your city for electricity for cooking, ironing, and other household uses? Is the cooking apparatus expensive? Could you afford an electric chafing dish? Coffee percolator? Plate for heating water? Which would save the most labor in preparing breakfast or other light meal?

CHAPTER III

WATER AND PREPARED BEVERAGES

LEMONADE

(Review Protection of Water Supply, page 37)

WATER AS A BEVERAGE

Pure water is the most important of our foods. We could live without bread and meat for weeks, but we would die of thirst in a few days.

Water may contain impurities that come from decaying vegetable or animal matter, or it may carry the germs of disease, or minute insects or their eggs, such as the hookworm. As it flows it gathers these impurities from the soil. It may also collect impurities from the dust of roofs and deposit them in cisterns. Where shallow wells are used water may wash filth into them, or seepage from closets or sinks may enter under the ground. In deep wells properly protected from insects and animals by high curbs, the water is usually pure because the many layers of soil, gravel, and rock through which it has filtered have taken out the impurities. It has been said that running water purifies itself. This is true in a measure only, and it is a very slow process. Certain kinds of bacteria destroy some of the organic impurities, some of the solid impurities settle, and some of the germs are destroyed by strong sunshine or light. One cannot be sure, however, that all the dangerous germs have been removed by the flowing of water.

EXPERIMENT I. *To test for impurities in water.* Pour a pint of water into a glass jar, fasten the top on tightly, put in a warm place for three days, then open it. If there is any foul odor it is an indication that decaying vegetable or animal substance is present.

Even apparently pure water may contain germs only visible under the microscope. If there is any question as to the purity of the water, send a sample to the state health laboratory or to a chemist for analysis.

To Destroy Disease Germs. If water is muddy let it settle, then pour off the clear water and boil it hard for five minutes. Put it into clean glass jars or bottles, cover it closely, and keep it cool. If it is exposed to dust when cooling, germs may be collected. Boiled water is flat because the air is driven off, and may be aerated by being poured from a pitcher held at some height into a drinking receptacle. Distilled water, if bottled under cleanly conditions, is very useful in times of typhoid or epidemics of like nature.

Hard and Soft Water. "Hard water" is water that contains a considerable amount of minerals. Very hard water is not good for drinking, as it disturbs the digestion and may cause kidney trouble. Hard water does not dissolve dirt as well as soft water does, and its minerals form an insoluble compound with soap put into it. In order to soften it add washing soda or borax before putting in the soap.

Soft water is best for cleaning purposes and for many cooking operations. Cistern water, if caught in clean cisterns, is very good, as it is perfectly soft.

General Suggestions. Drink plenty of clean, cool water, but do not have it very cold. If overheated, drink a little very slowly. *Use individual or clean drinking cups, and pour the water from a pitcher or use a cooler. Never dip your cup into the vessel containing the general supply.* Diphtheria, mumps, and other diseases may be contracted from a common drinking cup.

It is better to take an abundant supply of water half an hour before eating than to drink a quantity at meals. Much water, cool enough to be agreeable, if taken with food will lower the temperature of the stomach and dilute the digestive juices.

The connecting pipes from the street main to the house in cities and towns may be of lead. Water standing over night may dissolve some of the lead, so that it is important to let the water from pipes run for several minutes before using it in the morning, or after a house has been unoccupied for some time.

QUESTIONS AND PROBLEMS

What can you say of the importance of water? What impurities may be found in water? How do they enter? What diseases may be carried in water? Give a test for decaying matter in water. (See Experiment I.) What is the source of your water supply? Is it safe? Mention different sources from which water is obtained in your locality. Which is safest? How should a well be protected? A cistern? Visit a system of water works and find out the source of the supply. Is it pure? If not, how is it purified? What is a filtration plant? How may unsafe water be sterilized? Why is cistern water desirable? Why is an excess of minerals dangerous? What is meant by hard water? Soft water? Is the water at your home hard or soft? Why let the water in a city water system run through the pipes for several minutes before using it? Why are individual drinking cups needed? Have you individual cups and a cooler or sanitary fountains, in your school? Is the common drinking cup used? How much would it cost to change the conditions if they are objectionable? What can you say of drinking water with meals?

WATER IN COOKING

One of the most important substances with which we have to deal in cooking is water. We use it to soften the fibers and to carry heat. It has likewise the power of dissolving many substances, and so is both a carrier of flavor and a valuable cleansing agent.

Experiment II. Put a teaspoonful of salt in a glass of cold water and stir until dissolved. Repeat the experiment, using hot water. In which did the salt dissolve more rapidly?

Experiment III. Put a cup of water in a small saucepan and heat gradually. When the water first begins to heat, small bubbles of air form at the bottom and rise part of the way toward the top, but break as they reach the upper layer of cold water. As the water gets hotter, the air

bubbles reach the top and break. As it gets still hotter, larger bubbles form. These are steam bubbles, which as they reach the cooler water at the top, turn back into water. This process, which goes on for some time, is called simmering. If you have a thermometer, take the temperature of the water when it is bubbling this way. You will find that it is about 185° F. The water will grow still hotter, and finally the bubbles will reach the top and break, forming steam. The water is then boiling.

The Boiling Point of Water. The boiling temperature of water is 212° F. at the sea level, but in a higher altitude the steam will form before the water reaches this temperature, as the pressure of the air is less. For most places we may consider that water boils at 212° F. The true steam that forms at the spout of the teakettle is invisible. After the steam is cooled a little, it makes vapor—a gas that we can see.

Two kinds of thermometers are in use—the Fahrenheit with the freezing point at 32° and the boiling point at 212° at the sea level, and the Centigrade with 0° for freezing point and 100° for boiling point. The Fahrenheit thermometer is more generally used, but the Centigrade is used in most scientific work on account of the simplicity of its markings. How many degrees are there between the freezing and boiling points on the Fahrenheit scale? On the Centigrade? How many degrees F. equal 100 C? How could you change F. to C.? How C. to F.? (See Arithmetic.)

Experiment IV. Add two tablespoonfuls of sawdust to one cup of water, bring to the boiling point, and test the temperature. For this purpose, use a high temperature thermometer with the tip of each end protected by a cork. Notice the movement of the sawdust. What does this prove?

Experiment V. Add two tablespoonfuls of salt to one cup of water, bring to the boiling point, and test the temperature.

Compare the boiling temperatures in Experiments III, IV, and V. Which was hottest? Which is hottest—boiling water, syrup, or mush? When would contents of double boiler become hotter, over a kettle containing boiling salted water, or over plain boiling water?

Effect of Heat on Water. Fresh water contains air, which gives it a fresh, pleasant taste. When it is heated the air is gradually driven off, and after long continued heating it loses so

much air that it becomes flat. For this reason water that has just reached the boiling point should be used for beverages and for other cooking purposes.

Evaporation of Water. The changing of water to a gas or vapor is continually going on from the surface of lakes, rivers, and streams. During this change much heat is absorbed and the air and surroundings are cooled. This is noticeable when a lawn or porch is sprinkled on a hot day. The higher the wind the more rapid the evaporation. Why? People in hot climates where ice is scarce make use of the principle of evaporation in cooling food and beverages. You may have seen a Mexican water cooler made of porous earthenware so that the water may slowly escape through its pores and evaporate, thus cooling the contents. The desert water bag, made of heavy porous cotton, acts on this principle and is much used by travelers in the West. Again, when a wet cloth is wrapped about a jar of butter to keep it cool, this principle is applied. In the Southwest a substitute for a refrigerator is made on this plan.

Ice. Water may be found as a liquid—the form in which we know it best; as a gas—in steam and clouds; and as a solid—in ice. It becomes a solid from the effect of cold, or rather from the loss of heat. The freezing point of water is 32° F. Ice is of great use in preserving food. By mixing it with salt a freezing mixture is made. We are all familiar with the fact that water pipes burst from being frozen. Let us see why this is so.

Contraction and Expansion. In cooking, it is necessary to understand the principles of contraction and expansion due to a change of temperature. Contraction is the drawing together of the fine particles that make up a substance. Expansion is the spreading apart of these particles. We say that cold contracts and heat expands. For example, pastry is made by using ice cold water and by retaining as much air as possible. When the mixture is put into a hot oven it rises to several times its first height. This is an example of expansion by heating. If a toy balloon filled with gas is brought from the cold outdoor air into a warm room, the gas expands so that it bursts the covering.

Water contracts with cold like other substances until it is near the freezing point, when it suddenly expands, resulting in more ice than the original amount of water. This is the reason that pipes burst when water in them freezes.

Boiling Water. Keep the teakettle clean. If in a region where lime is deposited in the kettle, it may be soaked occasionally in moderately strong vinegar over night to soften the lime. Keep it covered and the steam will be condensed so that heat will be saved. When making tea or other beverages be ready to use the water the moment that it boils. Why? *Never use water from hot water pipes in preparing food.* Why?

QUESTIONS AND PROBLEMS

What foods are largely water? Why do we use water in cooking? What is the meaning of the term *dissolved*? What is a solvent? Describe the changes that take place when water is heated to the boiling point? What is the simmering temperature? The boiling point at sea level? Have you been in a region where the altitude was so great that water boiled before it reached this temperature? In what sections of our country could this happen? (See Geography.) What is the effect of heat on water? Why does boiled water taste flat?

What is meant by evaporation? What use do you make of cooling by evaporation? Have you ever seen a desert water bag? Bring such a bag to school and try keeping water in it during the day.

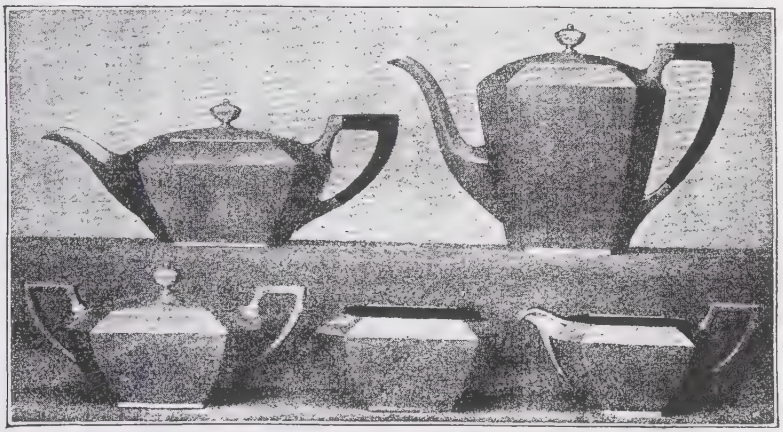
In what three forms may water exist? What form of water is each of the following: rain, hail, dew, frost, snow, cloud, and fog? Why do freezing water pipes burst? Is the ice you use at home natural or artificial? Is it clean and safe? Do you put it directly into water which you drink? (Visit the artificial ice factory if possible.) What process does water go through in an artificial ice factory before being frozen? Why? Tell how to boil water. How to clean a teakettle.

TEA

Tea is the dried leaf of the tea plant, a shrub that grows in China, Japan, and India. A very little tea is raised in South Carolina, also. Tea is of different grades, depending on the stage at which it is picked: the tender fresh leaves or buds just unfolding form the Pekoes; those a little older make Souchong, and

those still older, Congou. Trade names are given to the different teas according to the method of preparation.

The green teas were formerly colored, but this is now illegal. They are no longer bright but a dull yellow green. Green tea is not fermented in preparation for drinking; it therefore makes a harsh tea. It contains a high per cent of tannic acid, a substance that, in large quantity, interferes with digestion. Gun



A GOOD DESIGN OF SILVER TEA SERVICE

Powder, Young Hyson, Imperial, Green Japan, and uncolored Japan are some of the green teas.

The black teas undergo a process of fermentation by which some of the tannic acid is rendered insoluble. Because of this they are less apt to disturb digestion. English Breakfast, Pekoe, and Oolong are important black teas. All teas are mildly stimulating, as they contain *theine,* which has the effect of quickening or stimulating the action of the nerves.

Selecting Tea. In buying tea, choose the variety most pleasing to your taste. It should be free from stems and from fine powdered particles. When put in boiling water the leaves should not entirely unroll in a short time. Soak a pinch of tea, unroll the leaves, and note their size and shape. Also note pro-

portion of large to small leaves and stems. A very low priced tea is not really cheap. More is needed to give the required strength than with more expensive teas and it also yields more tannin, which we wish to avoid. Tea does not keep well, so it should be bought in small quantities and kept in air-tight glass jars.

*** Tea (Class Recipe)†**

1 tsp. tea 1 c. boiling water

A good grade of English Breakfast with a flavoring of Orange Pekoe makes a very pleasing tea. Use an earthenware pot for making tea (never make tea in a metal pot as the tannic acid acts upon the metal. See Experiment VIII, page 79.) Keep the pot very clean. Before making tea scald the pot by pouring boiling water into it. Put on the lid and let stand for a moment. Pour a little water out through the spout; take off the lid and pour out the remainder of the water. In measuring, pour a cup of water into the pot and estimate the amount by seeing how far the water rises on the sides of the pot. Empty pot, put the right amount of tea into the hot pot, and pour in as much boiling water as was used in the trial measuring process. Put on the lid, let stand (not over the fire) for three minutes, pour through a tea strainer into warm cups, and serve. Less tea may be used if weaker tea is desired. *Never steep tea more than five minutes,* as long steeping extracts too much tannin.

A SILVER TEA BALL

Tea may also be made at the table in a cup, by the use of a tea ball. The ball should not be more than two-thirds full of tea leaves.

Experiment VI. After tea has been left in a pot for ten minutes examine it; note the color; taste it. How does it affect the tongue? Boil a little of the tea and leaves for a few minutes in a small enameled saucepan. Note color and taste. *Never use tea that has boiled.*

* For starred recipes, see page 8.

† The term *Class Recipe* denotes that the quantity of ingredients indicated in the text is the amount necessary for successful manipulation by two pupils, working together. The same quantity is also required where individual work is done, except in dealing with whole apples, tomatoes, etc. The term *Class Recipe* ½, etc., means that the given quantity of ingredients should be divided for better adaptation for class use. In some cases, also, where the ingredients are expensive or where the quantity indicated would be large, the class recipe is given for a group of four or six pupils. Recipes not marked *Class Recipe* are adapted for family use and can be divided by the pupils after practice with class recipes.

EXPERIMENT VII. Fill a glass one-third full of tea that has been steeped three minutes and another one-third full of tea that has been steeped ten minutes. To each glass add one teaspoonful of ferrous sulphate solution; stir, let settle, and note the black precipitate that forms. This is tannate of iron. The quantity denotes the amount of tannin in the tea. Which glass shows the greater quantity? Test some of the boiled tea from Experiment VI in the same manner.

EXPERIMENT VIII. Pour a little tea into an old worn tin cup or pie plate. Account for result. Why not use a tin teapot?

COFFEE

Coffee is the berry of the coffee shrub which grows in Arabia, Abyssinia, other parts of the eastern hemisphere, and in Central and South America. It is sold under different names that once denoted the region from which it came. Mocha coffee once came from Arabia but the name is now used to denote a certain type of berry—a small, dark, high-grade berry of great strength. A large pale berry is of the Java type. Santos is a South American coffee of this type. Most of the ready roasted coffee is a blend—a mixture of different varieties.

Coffee, like tea, is a stimulant. It contains *caffeine*, the stimulating effect of which is very much the same as that of the stimulating element of tea. It also contains tannic acid, although when quickly made it probably has less tannic acid than tea. To some persons coffee is very irritating to the digestion on account of the oil it contains. Children do not require stimulants and should avoid tea and coffee.

Selecting Coffee. If coffee is to be roasted at home it is well to buy a year's supply at one time as raw coffee improves with keeping. Coffee roasted to a rich brown color gives the best flavor. Spread the coffee on a large pan, place it in a moderately hot oven, and stir frequently. Roasted coffee should be bought in small quantities as it deteriorates rapidly. Keep coffee in air-tight jars and grind as needed.

EXPERIMENT IX. *Adulterated Coffee.* Some ready ground coffee is adulterated by the addition of chicory or cereals.

To test for these impurities add a spoonful of ground coffee to a glass

of cold water. If the coffee is pure it will float and will not discolor the water for several minutes. If adulterated, it will sink to the bottom, leaving a brown stain in the water.

Making Coffee. Select well ripened, freshly roasted coffee of a good grade, and use a perfectly clean enameled or aluminum coffee pot. Coffee contains an oil that quickly becomes rancid if the pot is not thoroughly cleaned each time after using. A pot with a lip is easier to clean than one with a spout. For use in a drip pot or percolator, coffee should be finely ground; for boiled coffee the berry should be ground to a medium fineness. Serve coffee in warm cups while it is fresh and hot. If milk or cream is used it should be warmed before it is poured into the coffee.

*** Boiled Coffee (Class Recipe ½)**

⅓ c. ground coffee 2¼ c. water

Scald the coffee pot. Put in the coffee and add 2 cups cold water. Stir. Then boil for two minutes. Push it to the back of the stove. Pour out a half cup of coffee; return it to the pot. Add ¼ cup cold water and let stand for ten minutes to settle.

Coffee may be cleared with egg. Take one tablespoonful of egg white, or 1 teaspoonful and the shell. (If the shell is to be used, wash the egg thoroughly before breaking.) Mix coffee, egg, and 2 tablespoonfuls of cold water, and stir well. Add the water and proceed as above. Why does adding egg to coffee clear it? (See Clearing Soup Stock, page 174.)

COFFEE PERCOLATOR

Filtered Coffee

1 c. coffee 6 c. boiling water

Use percolator or French drip pot.

Scald the drip coffee pot, put in the coffee, and add the water a cup at a time. Keep warm over hot water till ready to serve. If a percolator is used, follow the directions accompanying it.

Coffee Substitutes. Some of the coffee substitutes are low-grade cereals combined with waste coffee. Others are purely cereal and have none of the stimulating properties of pure coffee except the mild stimulation due to the hot water they contain.

COCOA AND CHOCOLATE

COMPOSITION

	Water	Protein	Fat	Carbohydrate	Ash	Calories per lb.
Cocoa	4.6	21.6	28.9	37.7	7.2	2320
Chocolate	5.9	12.9	48.7	30.3	2.2	2860

Cocoa and chocolate are made from the bean of the cocoa tree. They are prepared by roasting and crushing the beans. In cocoa a part of the fat is removed; in chocolate it is all retained. Both cocoa and chocolate have starch added and in some preparations sugar and flavoring also are added. Pure chocolate is very nutritious, but unless made with milk the beverage is only slightly nourishing, as such a small proportion of the solid is used. Cocoa is less nourishing than chocolate. Both beverages contain *theobromine*, a stimulant like caffein but much weaker. These beverages should be taken very slowly on account of the starch they contain. Starchy foods must stay in the mouth long enough for the saliva to become mixed with them. They frequently disturb digestion on account of the fat they contain, which seems to disagree with many people.

Selecting Chocolate. For cooking purposes, choose the unsweetened chocolate, as it is less expensive. Keep chocolate and cocoa in the ice-box in hot weather or they may become rancid. Why?

* Cocoa (Class Recipe ¼)

1½ tbsp. cocoa
1½ tbsp. sugar
Pinch of salt
2 c. boiling water
2 c. scalded milk

Fill the lower part of a double boiler one-third full of boiling water. Then heat the milk in the boiler until fine bubbles appear around the edges. If a thermometer is at hand, test the temperature of the milk when scalded. Mix the cocoa and sugar in a small, smooth saucepan; add the boiling water gradually, stirring all the time. When the mixture is smooth, put it on the fire and boil for three minutes, then add the cocoa mixture to the milk. Stir well and cook for ten minutes in double boiler. If not needed for immediate service keep hot over a low fire. Before serving remove the skin that forms on the top and

beat with a dover egg beater till frothy. Pour into warm cups. A spoonful of whipped cream may be put on each cup.

Whipped Cream. Use a heavy cream at least twenty-four hours old if possible. If fresh cream is used chill for at least two hours. Put the cream into a bowl and surround with crushed ice unless the weather is very cold. If you wish to cool it quickly, mix coarse salt with the ice. If cream is too thick, dilute it with sweet milk. If warm, thick cream is beaten it will be very oily and may turn to butter. Beat with a dover egg beater until the mixture will hold its shape. If it is to be served with chocolate, fold in, after whipping, two tablespoonfuls of powdered sugar and one-half teaspoonful of vanilla for each cup of whipped cream. One cup of plain cream will be enough for twenty cups of chocolate.

*** Chocolate (Class Recipe ¼)**

1½ squares of bitter chocolate	4 tbsp. sugar
1 c. boiling water	3 c. scalded milk
½ tsp. vanilla	Pinch of salt

Put the sugar, salt, and chocolate (cut in pieces) into a small saucepan. Put this saucepan into another pan of hot water, and heat until the chocolate melts. Add boiling water gradually, stirring all the time. Boil over the fire for one minute. Finish as directed for cocoa. Add flavoring when ready to serve. Serve with whipped cream.

COLD BEVERAGES

*** Lemonade No. 1 (Class Recipe ¼)**

2 c. water	1 c. sugar
½ c. lemon juice	

Scrub the lemons well with a vegetable brush. Dry, cut in half, and squeeze, using a glass lemon squeezer. Boil sugar and water together for five minutes. Add the lemon juice and strain through a cheesecloth. Keep in a cold place. When ready to serve, add the syrup to ice water, using enough to give the desired acidity. This recipe will make one quart of lemonade.

*** Lemonade No. 2. (Class Recipe)**

1 c. cold water	2 tbsp. lemon juice
4 tbsp. sugar	

Prepare lemon juice as directed above, and strain. Mix juice and sugar, stir well, add water, and stir until dissolved. Half a slice of lemon, a piece of pineapple, a cherry, or a fresh strawberry, may be added to each glass.

QUESTIONS AND PROBLEMS

Where is tea grown? Make a collection of tea samples, comparing color, flavor, and price. Make into tea and compare quality. What is the difference between green and black tea? Tell how to select tea. What brand of tea is used in your home? What does it cost? What are the important points in making tea? What is the proportion of tea to water? What is meant by tannin or tannic acid? How can you make tea so as to get the least possible amount of tannin? Why is tannin objectionable? Why does tea stimulate the nerves?

From what country does your merchant get his coffee? What type of coffee do you use? Why is freshly roasted and ground coffee the most satisfactory? What is the proportion of coffee to water for filtered coffee? For boiled coffee? Tell how to make good coffee. Why does a coffee pot that is not kept clean spoil the flavor of the coffee? Give the test for adulterated coffee. Why are coffee and tea bad for young people? Describe some of the coffee substitutes.

What is chocolate? What is its composition? Which has the higher food value—chocolate or cocoa? Why? Why should chocolate be kept in the ice box in warm weather? Why do chocolate and cocoa sometimes disturb the digestion? What is the proportion of milk to water in chocolate? In cocoa? The proportion of chocolate to liquid? Cocoa to liquid? Why must both chocolate and cocoa be boiled? How is milk scalded? Why are they skimmed if allowed to stand before serving?

Give directions for whipping cream. Why is it cooled before whipping? Is it necessary to surround it with ice?

Take the recipe given, as a model and write a recipe for chocolate, using equal quantities of milk and water and one-half square of chocolate to each cup of liquid. Make chocolate by this recipe and compare with that made by given recipe. Which is cheaper? How much would a quart of each cost? Is cocoa cheaper than chocolate?

Supplementary Recipes

Iced Tea (p. 378)
After Dinner Coffee (p. 359)
Coffee in Quantity (p. 359)
Caterer's Punch (p. 374)

CHAPTER IV

FRUITS

COMPOSITION OF FRUITS

	WATER	PROTEIN	FAT	CARBOHYDRATES	FIBER	ASH	CALORIES PER LB.
Apple	84.6	.4	.5	14.2	1.2	.3	290
Banana	75.3	1.3	.6	22.	.1	.8	460
Grapes	79.	1.0	...	15.5	2.5	.5	....
Orange	86.9	.8	.2	11.6	...	.5	375
Peach	89.4	.7	.1	9.4	3.6	.4	190
Pineapple	89.3	.4	...	9.7	...	...	....
Plum	74.5	.9	...	19.1	.5	...	370
Strawberry	90.4	1.	.6	7.4	1.4	.6	180
Dates	20.8	4.4	...	65.7	5.5	1.5	....
Figs, uncooked	18.8	4.3	.3	74.2	...	24.	1475
Prunes, uncooked	22.3	2.1	...	73.3	...	2.3	1400
Raisins	14.6	2.6	3.3	76.1	...	3.4	1605

EXPERIMENT I. Hold a thin slice of apple in the light and examine its structure carefully. Compare with structure of vegetables.

EXPERIMENT II. Pare and weigh an apple. Cut in thin slices, and dry well in the sun or on back of range. Weigh again and note the loss of weight; of what did the lost weight consist? Note amount of water absorbed when cooking dried fruit.

Fresh fruits are among the most valuable articles in the diet. Except in the case of the banana and some of the very sweet fruits they are not rich in any of the three main food elements but are valuable for the acids and salts they supply. These elements keep the blood in a good condition; fruits also stimulate the activity of the bowels because of the presence of cellulose. In green fruit the carbohydrate is in an indigestible form and the cellulose is very hard. When the fruit ripens, the cellulose is softened and the carbohydrate is largely changed to sugar. Cooking fruit brings about the same changes.

No menu is well planned that does not contain fruit. The selection will depend upon the season, location, and price of fruit.

Selecting Fresh Fruit. Buy smooth, clean, well-ripened fruit that is not molded, bruised, or wilted.

Do not buy fruit that has been exposed to flies or dust. If there is a place for storage and a quantity can be used, it is much cheaper to buy such fruits as oranges and apples by the box. Keep in a cool place.

Serving Fresh Fruit. Use a fruit plate and silver knives when serving such fruit as peaches, bananas, pears, and apples. Finger bowls are often used after the fruit course, and paper napkins may be provided in order that the linen may not be stained. Be sure the fruit has been carefully inspected and that all decayed portions have been removed. *Always wash fruit before serving.* Serve it well cooled unless fresh from the orchard. Garnish with peach or grape leaves.

UNCOOKED FRUITS

Apples. Serve only mellow apples raw. Wipe fresh apples with a damp cloth and polish them with a soft, dry one. If apples are hard, they should be baked, steamed, or stewed.

**Berries.* Discard all imperfect berries. Place those to be served in a sieve and immerse for a moment in a bowl of cold water. If washed before the hulls are removed less juice will be lost. Strawberries may require several waters.

Grapes. If, after washing, they still seem dusty, or if they have been exposed to flies, plunge for a moment into boiling water, then into very cold water. Separate the bunches with scissors.

Peaches. Rub off the down. If they are to be sliced, remove skin and cut just before serving and sprinkle at once with sugar.

**Oranges.* Cut in half at right angles to the stem end and place a half on each plate. Lay an orange spoon on the plate at the side of the half orange. If served in sections oranges should be peeled. All the tough white fiber should then be removed. With a sharp knife remove each section, discarding the skin between the sections. (Never slice oranges horizontally as the inner skin is not digestible.) Sprinkle with sugar, cool for one hour, then serve.

Grape Fruit. Cut the fruit in half with a pointed knife, separate the pulp from the tough skin around the side; then loosen the tough skin in the center and with very pointed scissors cut it loose at the bottom and lift it out. Place the grape fruit in a large cocktail glass or on a fruit plate. Sprinkle with sugar, and put in a cool place for at least ten minutes before serving.

Bananas. Select soft, ripe bananas with unbroken skins and cut them from the stem. It is well to scrape the banana after peeling it to remove the white fiber of which there is very little in well ripened fruit. Bananas are not easy to digest, and so should be well chewed.

Lemons. Scrub lemons well with a brush and dry carefully. Never put the skin into the mouth as lemons and oranges carry many bacteria in the pores of their skins. Slice or cut into sections.

Pineapple. Pare the fruit and take out the eyes with a pointed knife. Pull from the core with a silver fork, then arrange in a glass dish and sprinkle with sugar. Set in a cold place for an hour.

Cantaloupes. Cantaloupes should be thoroughly cooled, washed, and dried; then cut and the seeds carefully removed just before serving. Serve small ones in halves; large ones in pieces of suitable size. Use a plate larger than a fruit plate. Never put ice in the cantaloupe as it spoils the flavor. Serve with a silver spoon and pass salt with it.

A Fruit Cocktail. A mixture of fruits that blend well together is often used for a first course at luncheons.

Combine equal parts of sliced peaches, strawberries cut in half, and pineapple; or banana, orange pulp, and grapes, with the seeds removed, cut in half (orange juice may be added if desired); or fresh cherries (stoned), grape fruit, orange pulp, and pineapple. Sweeten to taste, but do not make too sweet, for a first course should stimulate the appetite and therefore should be tart rather than sweet. Serve in small glasses placed in larger ones containing ice, or in sherbet cups set on a doily on a fruit plate.

COOKED FRUITS

* Baked Apples

The secret in baking apples is to select firm, juicy ones, to baste them frequently, and to have the oven hot.

Wash and core juicy, sour apples. Mealy ones will not keep their shape. Place in a smooth enameled or earthenware dish or pan, never in tin. Why? (See Experiment VIII, page 79.) Fill the center cavity of each apple with sugar, sprinkle a very little cinnamon over each, and pour in enough hot water to barely cover the bottom of the dish. Put them in a hot oven and baste, by pouring the syrup in the pan over them every ten minutes. The

syrup must be rather thick. If it is too low, add a little hot water but never have much in the pan at once. Cook until the apples are very tender when tried with a toothpick. When the apples are done, arrange them in a dish. Let the syrup cool slightly, then pour a little over and in the center of each apple. The syrup should jelly when cold. If cooking apples that burst as soon as they get very hot, a narrow strip of skin should be cut off all around the center before they are put in the oven.

Pears

Cut in half and bake as directed for apples.

* Apple Compote (Class Recipe ¼)

8 or 9 tart apples
1 stick cinnamon
1 c. sugar
1 c. water

Make syrup of water and sugar. Add cinnamon and boil for ten minutes. Peel and core apples. Add syrup. Let simmer until almost clear. Lift from the syrup, and cook in the oven for a few moments. Boil the syrup down until it jellies when cool. Serve apples with jelly in center.

Apple Sauce (Class Recipe ¼)

8 medium-sized, tart apples
1 inch of stick cinnamon
(or five whole cloves)
1 c. sugar
water

Pare, core, and quarter the apples. Put them in a saucepan with just enough water to keep them from burning. Add flavorings. Cook gently until the apples are soft, stirring frequently. Add sugar, and beat well.

* Stewed Apples

Pare, core, and cut into quarters. Cook gently with barely enough water to keep apples from sticking to the saucepan. When tender, sweeten to taste.

Peaches also may be cooked in this way.

Cranberry Sauce

2 c. cranberries
1 c. water
1 c. sugar

Pick over and wash the cranberries. Put them into a saucepan, add water, cover, and cook until the skin bursts. Strain through a sieve, add sugar, and cook gently for five minutes.

Cranberry Jam

Add one-half cup of water to the pulp. Rub through a sieve. Add half as much sugar as you have pulp, and bring to the boiling point.

* Dried Fruits

Select clean fruits, rather wrinkled than plump. If they are very plump they may have been soaked to make them heavier.

Dried fruits have had the water removed and should be soaked before being cooked. Inspect them very carefully for insects. Add warm water and let them stand in it for fifteen to twenty minutes. Then wash very clean, rubbing them well between the hands. Barely cover with cold water and soak over night. Cook very gently in a little water from two to six hours. Add sugar if needed, when tender. Serve hot or cold.

Prunes do not need sugar if cooked in very little water. Apples should be boiled, as the texture is improved thereby. They do not require long cooking.

Dried fruits may be steamed after soaking.

QUESTIONS AND PROBLEMS

What is the composition of the orange? Banana? Apple? Dried fig? Prune? What is the chief food element in fruit? Compare different fruits for food value. Why are fruits so valuable to the body? Why do fruits stimulate bowel activity? Why are green fruits indigestible? Which fruits contain much tough fiber? Why shun over-ripe fruits? Why is the banana indigestible? Why are fruits that have been exposed to flies and dust dangerous? Why should all fruits be well washed and dried before using? Why does not thorough washing make berries that have been exposed to flies safe to use? Why scald grapes? Why use silver knives and spoons and enameled ware kettles for fruit? What fruits are to be had in your market? What varieties of apples? Which are home grown? What fruits could you grow in your garden? What is the cheapest fruit in your market? How much would it cost to provide fruit for your family every day? Which would be the least expensive for dessert, a pudding, a pie, or fresh fruit? Which would be most beneficial? Make a list of fruits now in season that you could afford to serve for your family.

CHAPTER V

VEGETABLES

COMPOSITION OF VEGETABLES

	WATER	PROTEIN	FAT	CARBOHYDRATE	FIBER	ASH	CALORIES PER LB.
Asparagus, fresh	94.	1.8	.2	3.3	.8	.7	105
Beans, string	89.2	2.3	.3	7.4	1.9	.8	195
Beans, dried	7.1	20.	1.5	65.	...	4.	1625
Beets	87.5	1.6	.1	9.7	.9	1.1	215
Cabbage	91.5	1.6	.3	5.6	1.1	1.	145
Celery	94.5	1.1	.1	3.3	1.	...	85
Corn	75.4	3.1	1.1	19.7	.5	.7	470
Cucumbers	95.4	.8	.2	3.1	.7	.5	80
Turnip greens	86.7	4.2	.6	6.3	...	2.2	220
Lettuce	94.7	1.2	.3	2.9	.7	.9	90
Peas, green	74.6	7.	.5	16.9	1.7	1.	465
Potatoes, white	78.3	2.2	.1	18.4	.4	1.	385
Potatoes, sweet	69.	1.8	.7	27.4	1.3	1.1	570
Tomatoes	94.3	.9	.4	3.9	.6	.5	105

The name vegetable means anything that grows in the earth, but is now commonly applied to those plants which are used for food. Vegetables may be classified as flowers, seeds, roots, and tubers, according to the part that is eaten.

With the exception of the cereals, potatoes, and beans, vegetables have but little actual food value, but, like fruits, they are important in the diet on account of their salts and acids and for the cellulose which furnishes the bulk needed to keep the digestive machinery working. A diet low in green vegetables or fresh fruits is apt to cause constipation.

All vegetables are largely composed of water; next to water, carbohydrates are most abundant; traces of protein and fats are also found in them.

Mention some vegetables that contain fats (see Table). One that contains protein. One that contains starch. One that contains sugar. Test vegetables for these elements. (See Experiments I-X, pages 43-45. Classify vegetables named in recipes of this chapter including dried beans and potatoes) as green and starchy, according to composition (see Table).

By a simple experiment let us see what we mean by cellulose.

Experiment I. Grate a turnip. Squeeze the pulp into a bit of cheesecloth or a fine sieve and then inspect it carefully. The woody fiber remaining is cellulose. It must be softened by heat and moisture before it can be used and even then the body will get little actual nutriment from it. The more cellulose in a vegetable the more need there is of cooking it.

Experiment II. Prepare a potato in the same way as you prepared the turnip. Inspect the pulp and test it for starch. (See Experiment I, page 43.) The starch is so closely connected with the fiber that it cannot be separated except by cooking.

Experiment III. Grate a carrot. Squeeze out the juice, put it into a small saucepan, and boil it down. Taste it. What do carrots contain? What other root vegetables contain this substance?

Experiment IV. Examine thin slices of vegetables under a microscope, noticing the fiber.

Experiment V. Pare a potato and weigh it. Cut it in thin slices and put them into a warm, dry place (the warming oven or the back of the range will do) where they will dry but not cook. When thoroughly dry (several days may be needed) weigh them. What per cent has been lost? What substance was lost? Dry lettuce in this way, noting per cent of water.

Retaining the Minerals. The value to the body of the mineral salts derived from vegetables has only lately begun to attract the attention of physiologists. It has been proved beyond a doubt that perfect nourishment is possible only when all the required elements are supplied. Green vegetables are one of the chief sources of potash, iron, and other needed minerals. If much water is used in their cooking, not only is flavor lost but also these valuable salts. When cooked without paring, vegetables retain most of these salts, as do those whose juice is used as a sauce or those cooked in such a way that all the water used is evaporated. Where possible, cook vegetables by steaming or in a very small quantity of water.

Softening the Cellulose. As was seen from Experiment I, vegetables contain a tough woody fiber that requires softening by cooking. Some of this fiber is so tough that it must be removed either before or after cooking; for example, the husks of corn, the skin of beets, carrots, tomatoes, and the shell of the pumpkin. Some vegetables are cut into small pieces so that they may be softened. (Mention one.) The cellulose in young vegetables is more tender than in old ones; therefore they are more easily cooked. One of the important points in cooking vegetables is to soften the woody fiber. Vinegar is served with turnips and beets, and helps to soften the woody fiber.

Preserving the Flavor. Another important point in the cooking of vegetables is to preserve the flavor. It was found that the carrot juice was sweet because of the sugar. If the carrots were cooked in a large quantity of water, the juice would be in the water instead of in the carrots. Suggest a plan for cooking them so that the juice will remain.

As all vegetable flavors are easily dissipated by great heat, vegetables should not be boiled too rapidly. Unless very highly flavored, they should be cooked in the least water possible and drained, if needed, as soon as tender. The kind of water in which vegetables are cooked has much to do with their softness and flavor. Soft water, such as cistern water, should have a teaspoonful of salt added to each gallon when used for cooking fresh vegetables. In the case of dried peas or beans, the salt should be added after they are cooked.

Hard water may be softened by adding half a teaspoonful of soda to each gallon of water. This is needed for both fresh and dried peas and beans. Other green vegetables do not need soda, as their color and flavor are best preserved by slightly hard water.

Never cook vegetables in an iron vessel. Perfectly smooth enameled ware is best. Use freshly boiled water.

EXPERIMENT VI. Cook green vegetables, covered and uncovered, and note difference in color and flavor.

Seasoning and Serving. Do not serve more than one semi-liquid vegetable at one time. For instance, do not serve stewed tomatoes and stewed corn at the same meal; if it is desired to have the corn stewed, serve the tomatoes sliced, or have the corn cooked in a pudding or boiled on the cob if the tomatoes are stewed.

Any vegetable which is not served in the water in which it is cooked must be very thoroughly drained. Turn the vegetable into a colander or sieve, let it stand for a few moments, and then turn into the saucepan in which it was cooked and shake over the fire until quite dry. Greens, such as spinach or mustard, should always be pressed to remove the water, before they are brought to the table.

After draining, season so delicately that the flavor of the vegetable is not hidden; for instance, black pepper in green peas hides the flavor of the peas. For most vegetables, melted butter or a simple sauce is used. Allow two tablespoonfuls of melted butter or one cup of thick white sauce (see page 118) to each pint of vegetables. Turnips and beans may be cooked with a little salt pork. Corn, tomatoes, and green peas require a little sugar. Beets and greens are improved by a little lemon juice or vinegar. Serve cooked vegetables in warm dishes. All vegetables should be dry enough to be served on the plate and eaten with a fork.

Selection and Care. Vegetables are cheapest and best when in season, that is, when grown near the marketing place. Wilted vegetables are tough and lack flavor.

Root vegetables should be smooth and tender and of medium size, the tops being fresh and green. All green vegetables should be fresh and crisp and not too coarse. Vegetables should be kept in a clean, cool, dry place.

Preparation for Cooking. Examine all vegetables carefully to see that there are no insects on them. Wash thoroughly as they may be sandy or may have poisons on them which have been used to destroy insects. Then pare and cut them in pieces if required.

CANNED VEGETABLES

Select canned vegetables very carefully. Buy reliable brands in cans which have the name of the packer on the can. Read the label carefully and see that colorings and preservatives are not used. Examine the cans; if they bulge, the contents are spoiled and gas has formed. Old canned goods are not safe, as the tin may have been corroded by the acid of the contents. If many canned goods are used, buy them by the case at the season when the freshly packed article has come into market (usually in the autumn), and store in a cool place. Fresh green vegetables are better and cheaper than canned ones at most seasons. Compare prices of home canned vegetables with prices of the factory product.

Cooking Canned Vegetables. As they have been cooked, canned vegetables need only to be reheated and seasoned. As soon as the can is opened turn the contents into a bowl and air for an hour. If the commercial canned goods are used, drain off the liquid from asparagus, peas, and like vegetables, and wash them in a colander.

WHITE POTATOES

White, or Irish potatoes as they are called, are the enlarged underground stem of a plant which grows in many parts of our country.

Note composition of potato. To what class of food does it belong? A little mineral is found in potatoes, lying just under the skin. If they are pared too deeply, this mineral is lost. The juice contains a trace of protein.

Review Experiment I, page 43.

Choosing Potatoes. Potatoes are of different colors and shapes. They should be without cuts or bruises or soft spots, and should be smooth and firm to the touch. If sprouted, they are not fit for food. For most uses the medium-sized potato is the best as the very small ones have too much skin and are sometimes not well matured or ripened.

Keeping Potatoes. Keep potatoes in a cool, dry, dark place.

Paring Potatoes. Put potatoes into a pan of water and scrub well with a brush. If they are to be pared use a sharp vegetable knife and take off a very thin layer of the skin. Why should the paring be thin? Remove the eyes with the point of the knife. The potato should be smooth and white when it is pared. Put the pared potatoes into cold water if they are not to be cooked immediately. Why? If they are to be boiled without paring take off a thin layer of skin around the center. Old potatoes are improved if they are soaked in cold water for an hour or two before cooking.

Weigh the parings and other rejected parts. Then weigh the pared potatoes. What per cent is wasted? What precautions in handling potatoes will lessen the waste? What is the price per pound of potatoes?

Cooking Potatoes. As the principal food element in potatoes is starch they must be thoroughly cooked. Cook potatoes in a hot oven or in boiling water. If cooked too slowly they will be heavy and flat. Select potatoes of uniform size when they are to be served whole. When a potato is done it should be soft. Test by piercing with a fork or a toothpick. Serve on a warm dish as soon as cooked, as cold potatoes are heavy and indigestible.

Potatoes Boiled Without Paring

Prepare the potatoes according to directions. Place in a large saucepan and cover with boiling water. Boil briskly at first, then less briskly, and cook until soft. How are they tested? If boiled too rapidly the potatoes will become broken and soggy.

* Potatoes Pared and Boiled (Class Recipe 1 Potato)

Wash and pare the potatoes according to directions. Cook them whole if time permits. If not, cut them into halves or small cubes. Put them into a smooth enameled or aluminum saucepan, cover with boiling water, and boil briskly for the first ten minutes. Then lower the heat until the water just bubbles gently. When tender drain well. Put the potatoes back into the saucepan, dust with salt, and shake over the fire until they are perfectly

dry and white. In doing this take care that they do not burn. Turn them into a dish and pour white sauce over them, or sprinkle with finely chopped parsley and pour a little melted butter over them. Serve quickly with roast, steak, or fish.

To Shred Parsley. Wash the parsley through several waters and dry it in a soft towel. Gather the leaves in a bunch and cut them fine with a vegetable knife on a plate or board. Do not chop parsley.

***Mashed Potatoes (Class Recipe ¼; 1 Medium-Sized Potato)**

1 tbsp. butter	¼ tsp. white pepper	salt to taste
2 c. mashed potato	3 tbsp. hot milk	

Mash boiled potatoes through a ricer into a hot bowl. Add the butter melted in the hot milk, the pepper, and one-fourth to one-half teaspoonful of salt. Beat with a fork till white and creamy. Heap in a hot dish and serve quickly.

Potatoes Mashed and Browned. Put hot mashed potato into a pudding dish, with the potato slightly raised in the center. Brown in a quick oven and serve in the dish in which it was cooked. The top may be pricked with a fork before browning. Brush with egg yolk diluted with one tablespoonful of water if a rich golden color is desired.

Baked Potatoes

Potatoes are most easily digested when baked. Use large or medium-sized potatoes. Lay them on the grate of a hot oven, in a shallow baking pan, or on a patent roaster. Bake until soft, about forty minutes. When the potatoes are done press gently in a cloth, then make a deep gash across each with a knife so that the steam may find its way out. Put a bit of butter in each potato and serve on small plates. Potatoes may be pared before baking, if preferred.

***Boiled New Potatoes**

1 qt. new potatoes	1 c. rich milk or cream
1 tbsp. flour	1 tsp. butter
salt to taste	

Wash the potatoes well, put them into a bowl of water, and scrape off the skin with a vegetable knife. Wash clean, and drop into cold water until ready to cook. New potatoes are not so easy to digest as the fully ripened ones, owing to their density, and should not be eaten by invalids. They have in them a bitter, poisonous substance, called *solanin,* found near the skin. Much of this can be removed by putting the potatoes in

cold water, and boiling them for five minutes. (Starches are usually put into boiling water to secure a greater expansion of the starch grains, but this would prevent the escape of the solanin.) Then drain the potatoes and cook in boiling water until tender. Just before the potatoes are done, add one teaspoonful of salt for each quart of water in the saucepan. If the water is very soft, add salt at first. (See Hard and Soft Water, page 72.) When the potatoes are done, drain. Rub the flour with enough of the cold milk to make a paste. Add the rest of the milk, and pour it all into the kettle. Bring to the boiling point, stirring all the time. Add butter and salt, and serve.

Fried Potatoes (See Page 228)

SWEET POTATOES

Except for a little sugar, sweet potatoes are very much like white potatoes in composition, but are not as easy to digest. They are much used in warm climates in place of white potatoes. They keep well when canned. Select smooth-skinned, medium-sized potatoes with yellow flesh.

*Baked Sweet Potatoes

Proceed as for white potatoes. As they burn easily on account of the sugar in them, the oven must not be too hot.

*REHEATED POTATOES

Potatoes should not be eaten cold, as they are then very difficult to digest. If any baked potatoes are left from a meal, cut them in half while still warm, take out the pulp, and mash and season. Put the pulp back into the half shells and when ready to serve heat very hot in a moderate oven.

Boiled potatoes may be mashed and seasoned while warm, then reheated on top of a range or browned in an oven. Boiled white potatoes may also be used in cakes with meat or fish (See Codfish Balls, page 192), or used as a border for meat dishes, in a cottage pie, or in hash (See Left-over Meats, page 175).

Scalloped Potatoes

Use one-half as much white sauce as you have white potatoes. Put the cold potatoes, cut in cubes, into a shallow baking dish that has been greased. Sprinkle lightly with salt and pour over them the white sauce. Cover with fine bread or cracker crumbs, and cook for fifteen minutes in a moderately hot oven. The crumbs must be a delicate brown. Serve in the dish in which they were cooked.

QUESTIONS AND PROBLEMS

What is the composition of the potato? Where is the mineral substance in potatoes? What use are potatoes to the body? Why do they need thorough cooking? Describe the manner of cooking potatoes. Why must potatoes be served hot? What elements are lost in soaking them? What foods should be served with them to make a balanced ration? How would you reheat potatoes? Compare the cost of a pound of potatoes and a pound of rice? How do these two vegetables compare in food value? Which will go farther in serving? Tell how to keep potatoes. How would you utilize cold potatoes? Why should new potatoes be put to cook in cold water? What difference is there between white and sweet potatoes? How does this difference affect the temperature for baking?

GREEN VEGETABLES

Asparagus

Select plump white stalks, as the small green tips are apt to be bitter. See that the stalks have been freshly cut.

Wash asparagus in clean, cold water and cut off the tips as far down as they are brittle. Reserve the tough part for soup. Tie the tips in bunches for each serving and then tie all together. Place the bunches in a deep saucepan, and pour in enough boiling water to cover all but the tips. Put on the lid and boil till tender—about forty-five minutes. Shortly before cooking is finished add salt, allowing a teaspoonful to a quart of water. Then add enough boiling water to cover completely and cook for ten minutes.

Drain and arrange each bunch on an oblong slice of toast that has been slightly moistened with the water in which the asparagus was cooked. Cover with melted butter or Hollandaise Sauce and serve with roast fowl or broiled meats, or as a separate course.

* Boiled Beets

1 bunch beets
¼ tsp. salt
2 tbsp. melted butter
1 tsp. sugar
1 tsp. vinegar

Wash clean but do not remove roots or all of stem. Barely cover with boiling water and cook until tender—from one to three hours. The cellulose in old beets is so like wood that it cannot be softened. Test with a toothpick. Drain. Plunge the beets into cold water, remove at once, slip off the skins and cut into slices, quarters, or eighths. Beat the melted butter, sugar, salt, and vinegar together, and when thoroughly mixed, pour over the beets. They may also be seasoned with salt and butter or with vinegar to which has been added a little salt and sugar.

* Carrots

Carrots should be eaten when young. Wash, scrape off the skin, and cook in barely enough boiling salted water to cover them. Add one teaspoonful of butter to the water and boil the water down as low as possible. An hour and a quarter will be needed for cooking carrots. When tender, drain. Season with melted butter or white sauce.

Carrots may be served with peas. Cut into strips after scraping and boil for an hour, letting all the water evaporate. Then arrange in the center of the dish and pour the peas around them. Why is little water used in cooking carrots?

*Boiled or Steamed Squash

Summer squashes should be thin skinned and tender. As they have little woody fiber, they can be eaten by those who have a very delicate digestion, and may be cooked without paring. Cut into thick slices, barely cover with boiling water, and cook until tender. Then dry out the water, or steam, as directed below. Shake over the fire, and season with butter and salt. Squashes burn easily on account of the sugar in them.

Winter squashes and pumpkins require more time for cooking than summer squashes, as the woody fiber is tougher.

Boiled or Steamed Pumpkin

Remove the seeds, cut into strips, and pare. Boil as summer squash. Cook in a steamer or put a wire rack in the bottom of a saucepan or pot and pour in a small quantity of hot water. Place the pumpkin on the rack and cover. Cook until tender (several hours will be needed). Remove from the pot and mash thoroughly. It may be used immediately for pies or as a vegetable, or a part of it may be kept in a very cold place till next day. For use as a vegetable, put it into a small pan and bake for one hour or until perfectly dry. Watch carefully to prevent burning. After baking for half an hour sprinkle lightly with sugar and stir well. When ready to serve add two tablespoonfuls of butter.

* String Beans (Class Recipe)

1 pt. beans
salt to taste
1 tsp. of butter, or 1 slice of salt pork
¼ c. cream if no pork is used
1 tsp. flour
a pinch of soda (the size of a pea)
boiling water to cover

String the beans, breaking them into half-inch lengths, and wash. Add soda unless the water is very soft. Cover with boiling water, and add the butter or salt pork. Cook gently until tender. Add salt fifteen minutes

before the beans are done. Drain and add the cream rubbed to a paste with the flour. Bring to the boiling point. Taste to see if properly salted. If pork is used drain and serve.

Peas and beans contain a vegetable protein, called *legumin*, which is insoluble (cannot be dissolved) in hard water. Soda is added to correct this. The skin of beans is tough but a little fat put in at the beginning softens it.

* Green Peas (Class Recipe ½)

1 pt. peas	½ tbsp. sugar
1 tsp. flour	¼ tsp. salt.
1 tsp. butter	½ c. cream

Select fresh, well-filled green pods, as yellow peas are old or from vines that are dying. Shell and wash in cold water. Put in a very cool place for an hour unless the peas are freshly picked. Cook as directed for string beans, salt to taste fifteen minutes before they are done; when tender add the sugar, cream, and flour rubbed together, bring to the boiling point and add salt if needed. Serve in croustades. (See page 219.) Measure peas before and after shelling. How many quarts of green peas equal 1 pint shelled?

* Cabbage with White Sauce

Select a firm, white head of cabbage (dark spots are a sign of age), heavy in proportion to its size. Take off the outside leaves and cut the cabbage into eighths, removing as much of the central stalk as possible. Soak in cold water for an hour. Fill a large saucepan two-thirds full of boiling water. Cabbage, being of strong flavor, may be cooked in more water than a vegetable of delicate flavor. Allow one teaspoonful of salt to each quart of water. When the water is boiling hard put in the cabbage, bring to the boiling point, then keep hot for twenty minutes, or until tender, but do not allow it to boil. Drain, arrange on a platter, and pour a thick white sauce over it, or serve with melted butter. Another method is to boil one-fourth pound of salt pork in the water for fifteen minutes before putting in the cabbage and continue cooking it with the cabbage. When cooked, drain and serve.

Cauliflower with Hollandaise Sauce

Select a firm, white head with no black spots and remove the outer leaves and as much stem as possible. Wash very carefully and soak in cold water, head down, for an hour. Then tie in cheesecloth and cook, stem down, in boiling salted water to cover (1 tsp. salt to 1 qt. water) for twenty minutes, or longer if the head is very large. Test for tenderness

with a straw. When tender, drain, arrange in a shallow vegetable dish, head up, and pour over it Hollandaise Sauce, melted butter, or White Sauce. (For Hollandaise Sauce, see page 192.) Cauliflower may be broken into pieces before cooking.

*Spinach (Class Recipe)

½ pk. spinach
1 c. water
2 tbsp. melted butter
1 tsp. salt
2 hard cooked eggs

Select young, crisp greens; leaves that have been eaten by insects are inferior. Pick them over, inspecting carefully for insects. Wash through several waters and shake well to take off the sand. Cut off the stems. Put spinach into a saucepan and pour the boiling water over it. Cook gently, lifting now and then to prevent sticking. Cook from thirty to sixty minutes, according to age of vegetable. Drain when tender. Reheat and sprinkle with salt. Add the butter. Mix well. Press in a hot bowl for a few minutes and then turn on to a hot platter. Garnish with the eggs cut in slices, and serve with broiled or roast meat.

Mustard or Turnip Greens

1 pk. greens
¼ lb. salt pork
2 tsp. salt
2 qts. water

Select and prepare mustard greens as directed for spinach. Put the pork into the boiling water, add the greens and let boil gently from two to four hours, according to the toughness of the greens. Drain, chop, and reheat. Serve hot. Pass vinegar with greens. If desired omit the pork, and, after reheating, season with butter. Serve with pork or beef.

*Boiled Green Corn

Since corn, like peas, does not keep well on account of its sugar, it must be freshly gathered. It should be cooked in very little water or its sweetness will be lost.

Remove part of the husk, turn back the remainder and pick off the silks. If insects have been on the tip of the ear, trim well. Pull the husks over the end and tie with a piece of husk. Barely cover with boiling water, bring to the boiling point, and cook for ten minutes at a temperature just below the boiling point. Then drain, remove the husks, and serve hot. The husks may be removed before cooking.

* Stewed Tomatoes (Class Recipe)

1 pt. tomatoes	2 tbsp. butter
1 tbsp. sugar	salt to taste

Select firm, well ripened tomatoes. Inspect the stem end to see that there is no hole showing the presence of insects. Plunge the tomatoes into boiling water for a moment, then into cold. Peel and chop, rejecting the core. Cook gently in an enameled saucepan. (Never cook tomatoes in tin or iron.) When the pulp is tender, add the flour rubbed to a paste in a little cooled tomato. Stir until it boils. Add salt and sugar. When just ready to serve add butter and pour it over bits of toast arranged in a bowl. Toast may be omitted and tomato served to accompany steamed rice.

Boiled Okra

Okra must be young, tender, and unwilted. Wash carefully. Cut off the stems just even with the pod. Cook gently in boiling water until tender. Drain in a colander. Pour a little boiling water over it, drain well, and turn into a warm dish. Sprinkle with salt, pour melted butter over it, and serve.

*Stuffed Egg Plant

Select an egg plant that is heavy in proportion to its size. (If too old, it is bitter.) Wipe clean and bake in a moderately hot oven until it is tender Cut in half, scoop out the pulp, and chop fine, rejecting seed or hard parts. Then add an equal quantity of bread crumbs, a tablespoonful of butter, and salt to taste. Refill the shells and bake until nicely browned, or cook the pulp and crumbs in a baking dish until brown.

* Boiled Onions, Cream Sauce

Paring Onions. If only one onion is needed pare on paper. Use a fork to hold the onion and a sharp pointed knife to pull off the skin. Keep onion as far from the eyes as possible. Dip in cold water to wash. When a number of onions are to be pared, put them in a large bowl, cover with cold water, and pare, using a knife and fork. Clean immediately, with a cleansing powder, all utensils in which onions have been used.

Pare the onions, and wash. Barely cover with boiling water. Add salt, allowing one tablespoonful to each quart of water. Cook gently, uncovered, until tender. (About three-quarters of an hour.) When done they should be quite tender when pierced with a toothpick. Drain. Arrange in a serving dish and pour a white sauce over them.

DRIED PEAS AND BEANS

Dried peas and beans are rich in protein. In addition to protein, beans contain a large proportion of carbohydrates and some sulphur. As they lack fat, they are usually cooked with pork.

Digestibility of Beans. The food value of beans is dependent on the digestive power of the person using them. One engaged in hard physical labor in the open air may be able to make beans his chief source of protein, but the indoor worker should use them sparingly, if at all, as they are very difficult to digest.

Selecting Beans. In buying beans, see that they are clean —that is, free from weevils, tiny stones, and earth. They may be bought in quantity in the fall, but in the spring and summer they should be bought in small quantities only, as the older the beans, the tougher the fiber, and the more difficult they are to cook. Keep peas and beans in glass jars.

Cooking Beans. Look over the beans carefully, rejecting all imperfect ones. Wash clean and soak in soft water from eight to twenty-four hours. The skin of dried peas and beans is tough and unless soaked it is almost impossible to soften it by cooking. Cook beans in soft water if possible. As legumin, the protein element of beans, is rendered insoluble by hard water, they cannot be cooked in it unless soda is added. Even in soft water a little soda is useful as it helps to soften the legumin; add from one-fourth to one teaspoonful of soda to each quart of dried beans, depending on the kind of water. Rain water or that from artificial ice softens beans quickly. Long, gentle cooking seems to develop the flavor of beans and removes the granular texture. The fireless cooker is well adapted to the cooking of these dried vegetables.

*Boston Baked Beans

5 c. navy beans	¾ lb. salt pork
½ tsp. bicarbonate of soda	3 tbsp. sugarhouse molasses
1 tsp. salt	a dash of cayenne pepper

(The different operations in preparing the beans may be done by different classes; the baking may be done in earthenware cups.)

Prepare the beans as directed and bring gradually to the boiling point. Then put in the pork with the rind scored in one-fourth inch strips. Let simmer very gently until the skin cracks. Remove the pork and drain the beans. Turn into a bean pot or earthen bowl and sink the pork in the center. Sprinkle lightly with pepper and pour on the molasses. Add one teaspoonful of salt to two cups of water in which the beans were cooked, and pour over the beans. Then cover closely and bake very slowly for five or six hours. If desired, one pint of hot tomato sauce may be poured over the beans half an hour before serving.

This gives a large quantity, but as beans keep well if kept very cold, it is well to prepare a large amount at one time. In hot weather cook a smaller quantity.

Baked Beans Reheated

Put the beans into a granite or enameled pan. Add a few tablespoonfuls of boiling water. Cover closely and keep in the oven until very hot. Dip the edges of well browned toast into boiling water slightly salted. Butter each slice, and arrange on a large platter. Heap the beans on the toast, and serve with broiled bacon.

VEGETABLE CREAM SOUPS

Inferior vegetables such as large peas or coarse pieces of celery may be used for soups. These soups may be made with milk or stock for a foundation, and are thickened with flour or cornstarch. A rather thin soup is known as a cream soup, while a thick one is called a purée; for example, Cream of Celery, or Purée of Peas. The soup must be smooth and free of lumps, with no tendency to settle—that is, to be thin on top and thick at the bottom.

(Review Experiments IV, V, VII, page 117, and White Sauce, page 118.)

* Cream of Pea Soup (Class Recipe)

2 c. large peas (canned or fresh)
2 tbsp. flour
⅛ tsp. white pepper
2 tbsp. butter
2 c. cold water
1 tsp. sugar
1 tsp. salt
1 slice onion
4 c. milk

Cook fresh peas until tender, adding the sugar twenty minutes before they are done. When tender, rub through a sieve. Measure the water in which they were cooked and add enough more to make the two cups. Rub the flour to a paste with some of the same liquid. Put the pulp and the liquid into a saucepan, stir until it thickens, and bring to the boiling point. Have the milk scalded with the onion in a double boiler, and add to the pea mixture. Heat it very hot, then return to the double boiler, adding butter and seasonings. Serve in hot cups, with croutons.

For a purée, use half the quantity of milk. If canned peas are used, drain and air, then cook with the cold water and sugar for twenty minutes, and finish as directed. Compare proportions of milk and flour in cream soups and in white sauces.

VEGETABLE SALADS

The term salad refers in particular to uncooked vegetables served with a dressing which usually contains fat combined with other ingredients. They are very valuable in the diet, as they supply vegetable salts and give the needed bulk. Being served raw, salad vegetables may be carriers of disease unless they are grown in clean places and have been protected from flies and dirt. They may carry disease germs or the eggs of parasites.

Plants for salad must be clean, tender, and crisp, never wilted. Keep in the ice-box, wrapped in a damp cloth. As salads must never be watery, add the dressing just before serving.

Celery. Celery is usually eaten raw and should be washed very carefully. When ready to serve, scrape the stalks with a knife. When celery is chopped for salad, moisten immediately with a few drops of lemon juice to keep it white.

* Lettuce Salad

If a very firm head of lettuce is used, it may be cut into quarters or halves for washing. If the head is not firm, separate the leaves, rejecting all imperfect ones, and inspect carefully for insects. Wash in an abundance of water, shaking the leaves up and down to remove sand. Wrap in a cheesecloth wrung out of cold water, and lay on ice until desired. Then press gently between soft, clean towels. Do not crush the lettuce. Arrange in a salad bowl and cover with the simple dressing given below, or arrange on individual salad plates and serve the dressing separately. This salad may be served with French Dressing. (See page 233.)

A Simple Salad Dressing

½ tsp. salt
1 egg yolk
a pinch of cayenne or paprika
6 tbsp. melted butter
1 tbsp. lemon juice or vinegar

Beat the egg well, adding gradually a part of the butter. Then add salt and pepper, lemon juice, and the remainder of the butter. Serve immediately.

*Sliced Tomatoes

Scald the tomatoes as directed in Stewed Tomatoes, or wipe with a damp cloth, scrape the skin with a dull knife till loosened, then peel and slice. Arrange on lettuce leaves and cover with Cooked Salad Dressing (See below), or Mayonnaise (See page 233).

* Waldorf Salad (Class Recipe)

1 apple
1 tbsp. Mayonnaise
1 tbsp. chopped celery
lemon juice

Scoop out the pulp of the apple with a spoon. Chop fine. Moisten slightly with lemon juice, and mix it with the celery. Wrap in a damp cloth and put in the refrigerator. Drop shell of apple in cold water. When ready to serve mix Mayonnaise, celery, and apple. Fill the apple cup with mixture, and place on a dainty mat on a small plate.

*Cole Slaw (Class Recipe ¼)

1 c. cooked salad dressing
½ small head of cabbage

Remove outer leaves from a head of cabbage; let cabbage stand in cold water for thirty minutes. Dry on a cloth and then remove the stalk. Shred the cabbage very fine and mix the dressing with it. Serve very cold.

* Cooked Salad Dressing

1 tsp. salt
¼ tsp. cayenne
2 tbsp. butter
2 egg yolks
1 tsp. mustard
1 tsp. sugar
1 c. water
1 tbsp. vinegar

Mix dry ingredients in a bowl. Stir in slightly beaten egg yolks and melted butter. Add the boiling water. Put into a double boiler and heat

stirring all the time. When it begins to coat the spoon, add very gradually the vinegar mixed with two tablespoonfuls of hot water, beating all the time. Strain and cool.

Potato Salad

Potato salad differs from the other salads in that it is a very starchy food.

Boil four potatoes. Peel and cut them, while hot, into a French Dressing to which finely chopped onion has been added—one small onion to four potatoes being a liberal allowance. Onion juice may be used instead of chopped onion. Taste to see if enough salt has been used. Keep in a cold place until serving time, then garnish with parsley and hard cooked eggs. The quantity of dressing used depends on individual taste.

QUESTIONS AND PROBLEMS

What are vegetables? Of what value are they in the diet? How are the minerals best retained? What is cellulose? How is it affected by cooking? Why are most vegetables cooked in very little water? Mention two vegetables that contain sugar. What effect has too great a heat or long continued cooking on vegetables? What kind of water is best for cooking vegetables? How may cistern water be made slightly hard? How may hard water be softened? What kind of utensils would you select for vegetables? Tell how to serve vegetables. Why are simple seasonings best for vegetables? Tell how to select the vegetables used in your lesson. Tell what you would buy for a given sum for your family in your market. Give directions for selecting each vegetable purchased. What part of the money spent for food in your family is expended for vegetables? Compare this with the amount spent for meats, fruits, and starchy foods. How does the actual food value compare in each case? Considering the value of vegetable acids and salts, is the expense of vegetables justified? Which is better for a person who is too liberally fed, potatoes or lettuce? For the underfed? What is meant when you speak of vegetables which are in season?

What vegetables are utilized for soups? When milk is used as a base for the soup, what caution should be used in selecting the remainder of the menu? Describe the process of making a cream soup. What is meant by a purée? Which is of higher food value, cream of pea or tomato soup?

Why is it so necessary to select salad plants grown in a clean place and protected from flies and dust? How could you secure such plants? Which salad plants grow well in your locality? How should vegetables be kept for salads?

What kinds of dried peas and beans are used in your locality? Bring samples to the class. Where are they grown? How are they kept?

What is the food value of beans? In what food element are they lacking? Compare their composition with that of meat. Of milk. Compare the cost of beans for a meal with that of stew, and of broiled steak. Compare the time of cooking. Read the recipe for baked beans. How much pork is used? How much does it cost per pound?

What food or foods would you serve with beans to make a palatable and well balanced meal?

What can you say of the digestibility of beans? Could beans be substituted for part of the meat used in your family?

Why should beans be soaked before cooking? Why is soda added? How much soda is used to a quart of water? Why is soft water best for cooking beans? Why is fat added early in the cooking process? How long does it take to cook beans tender in the water you use?

Supplementary Recipes

Potatoes Cooked with Roast Beef (p. 380)
Puffed Potatoes (p. 380)
Boiled Sweet Potatoes (p. 380)
*Sweet Potato Cakes (p. 380)
Boiled Turnips (p. 380)
*Baked Squash (p. 381)
Kershaw (p. 381)
*Lima Beans (p. 381)
Black-eyed Peas (p. 381)
*Stewed Corn (p. 382)
Corn with Tomatoes (p. 382)
Corn Pudding (p. 382)
Baked Tomatoes (p. 382)
Broiled Tomatoes (p. 383)
Tomatoes with Okra (p. 383)
*Stuffed Peppers (p. 383)
Baked or Broiled Egg Plant (p. 383)
*Stewed Rhubarb (p. 384)
Cream of Celery Soup (p. 377)
Tomato Soup (p. 377)
Cream of Potato Soup (p. 377)
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Sliced Cucumber Salad (p. 375)
Grape Fruit Salad (p. 375)
Tomato and Pineapple Salad (p. 375)
White Beans with Rice (p. 384)
Red Beans or Frijoles (p. 384)

CHAPTER VI

CANNING AND PRESERVING FRUITS AND VEGETABLES: MAKING JELLIES

(Review Yeast, Mold, and Bacteria, page 28)

CANNING

As all fruits and vegetables spoil because of the growth of microscopic plants in them, they may be preserved by any means that will destroy the bacteria, yeasts, and molds present and keep others from entering. These tiny plants are found everywhere, particularly in dust. Like the yeast plant, they all require food, moisture, and warmth for growth, and like the yeast plant they die if heated very hot. Some of them, however, can stand great heat, because at a certain stage of their growth they are in the form of spores which boiling will not destroy. If they are heated very hot for three successive days all bacteria will be killed, as each day a part of them will be in a form that cannot stand the heat. The spores may be compared to a seed, a sprouted seed being easy to kill, while a hard dry one is not. Drying also destroys bacteria.

EXPERIMENT I. Put a slice of fresh apple or other fruit into a small screw-top jar, cover with cold water, and seal. Set aside for a week and then note condition.

EXPERIMENT II. Repeat Experiment I but heat jar for one hour, as directed for Canning Fruit with Single Cooking, page 110. Compare results. Where was decomposition going on? What causes fruit to spoil? Why does subjecting it to heat by cooking prevent it from spoiling? Why is sealing necessary?

EXPERIMENT III. Repeat II, but remove lid after heating.

Two Methods of Canning. There are two ways of canning—one in which the fruit or vegetable is heated only once, the

other where it is heated on three successive days. The latter method is the more satisfactory for the home canner. Acid fruits and vegetables may be canned by the first method if preferred, although the second method is the surest.

The Cost. Home canned fruits and vegetables are far cheaper than the commercial product, even if the material is purchased. When it is home grown there is of course a greater saving, and the quality is usually better because the home canner will not use green or overripe fruits.

SOME GOOD TYPES OF JARS AND GLASSES

Selecting the Material. Can fruits and vegetables when in season. The home grown fruits are usually the best, but in some localities the shipped fruits are the only ones available. If they have been long in cold storage they will not be satisfactory. Select fresh, crisp, medium-sized fruits and vegetables.

The best fruits for canning are pears, plums, peaches, figs, apples, pineapples, and cherries. Among the vegetables, tomatoes, corn, beans, beets, okra, asparagus, pumpkin, and sweet potatoes are very satisfactory.

The Best Jars. Use glass jars for canning—they are far safer and really no more costly than tins, as a tin can should

not be used more than once, while glass jars can be used for years and very few will be broken if carefully handled.

The jars with glass tops fastened by a wire spring attached to the jar are the most satisfactory. Select jars of a size to suit your family, and buy new rubbers each time a jar is used. Test jars by filling them with water, sealing, and inverting. If water escapes, lid or rubber is defective.

Canning Fruit With Three Cookings. Use perfectly smooth enameled pans and kettles and wooden spoons in the cooking process. Use no tin or iron. Have everything very clean. Prepare the fruit and pack it in the jar tightly up to within an inch of the top. Fill with whatever liquid is to be used. Put on the rubber and the lid, but do not fasten the lid down. Then place the jar on a rack or folded cloth in a large kettle that can be closely covered. Pour in enough water to reach up several inches on the jars, cover the kettle, and place it over the fire. When hot lift the lids and add sugar, if it is to be used, from ¼ c. to 1 c. of sugar to 1 quart jar of fruit, depending on the acidity of fruit. Bring to the boiling point and boil for ten minutes. Then fasten on the lids and (for most fruits) boil for thirty minutes; put in a place free from a draft to cool. On second and third days, arrange the jars as on the first day and boil for twenty minutes. *Do not open the jar after the first sealing.*

Canned Peaches

Use firm, solid fruit. Peel and cut in half. If clingstone peaches are used, they may be canned whole. Fill each jar as the peaches are peeled and add water so that they will not discolor. Proceed according to general directions. After sealing on first day, boil for ten minutes; on two succeeding days boil for twenty minutes. Small pieces of fruit may be canned in the same way for pies, using one-fourth cup of sugar.

Canning Fruit With Single Cooking. Proceed as directed above, but fasten down the lids after first heating, and boil for one hour before storing. This method may be used for most acid fruits that are not dense in texture, but it is not desirable for solid fruits or for vegetables.

Fruit Cooked Before Canning. Make a syrup, using one-third of the weight of the fruit in sugar, and allowing three cups of water for each pound of sugar; for example, to six pounds of fruit allow two pounds of sugar and six cups of water. Boil the syrup for ten minutes, using a shallow kettle. Put in the pared fruit, cut in halves, and cook gently until tender. Pack closely in hot sterilized jars. (See Preserving, page 112.) Fill with syrup, and seal.

Fruit may be cooked in water and canned in this way. Berries do not require water.

Canning Vegetables. Proceed according to the general directions for canning, but cook vegetables for fifteen minutes before sealing, then for forty-five minutes. Boil for one hour on second and third days. Cook mixed vegetables for one hour and thirty minutes. *As the water around the jars boils down replenish with boiling water, never with cold.* Store canned foods in a cool, dry, dark place.

Corn

Select tender sweet corn and can as soon as possible after picking. Prepare the corn as for cooking, then cut a very thin slice from the top of each row of grains, and scrape with the back of a knife. Put the pulp into pint jars, add one-fourth teaspoonful of salt, and fill with cold water. Proceed as directed.

String Beans

Wash and string tender beans. Boil in a sack or wire basket for ten minutes. Drain, cool slightly, and pack in jars. Proceed as for corn.

QUESTIONS AND PROBLEMS

Why does continued cooking preserve fruits and vegetables? What jars are most desirable? Why not open the jars after the first sealing? Tell how to select fruit or vegetables for canning. Estimate the cost of one dozen jars of home canned corn, beans, tomatoes, plums, peaches, or berries, including fuel. When tomatoes are eighty cents a bushel, how much will twelve quart jars of the vegetable cost? How does this compare with those bought at the grocery? Do you raise your vegetables or buy them? Tell how to can corn, tomatoes, okra. How should canned foods be stored? Do canned fruit and vegetables take the place of fresh ones in a person's diet?

PRESERVING

Fruit is made into preserves by being cooked with sugar until quite thick, then sealed while hot. Preserves do not fill the place of fresh fruit in the diet and must be ranked with sweets. Peaches, plums, pears, figs, the rind of watermelon, and tomatoes are all used for preserves.

Fruit must be in good condition—not overripe. If it is desirable to preserve the shape, be very careful in handling the fruit. For soft fruits, such as well ripened peaches, a syrup is prepared first, then the fruit is added and cooked until clear. Where color and shape are not so important, the fruit and sugar may be cooked together. Syrup burns easily, so the cooking must be gentle. Use a shallow kettle for preserves, for if the mass is heavy the shape of individual fruit is spoiled.

The proportion of sugar to fruit varies according to the acidity. Water is used in making the syrup for the drier fruits, such as plums, while berries, figs, and tomatoes require no water.

To Sterilize Jars and Glasses. After washing them very clean, lay jars and lids on a rack or towel in a kettle and cover with cold water. Heat gradually to the boiling point and boil for 15 to 20 minutes. Keep them hot until ready to use. Lift out with a long fork, set on a towel, and fill immediately with hot fruit. After a jar is filled, pass the handle of a silver spoon that has been scalded, around inside the jar to force out air bubbles. Adjust the rubber and fasten on the lid.

*Japanese Plums

Prepare a syrup, allowing three-fourths of a pound of sugar to one pound of fruit, and half a cup of water to each pound of sugar. Bring the syrup to the boiling point. Skim. Then cook until moderately thick. Add the fruit, first pricking the skin with a knitting needle four or five times. Cook gently until clear and until the syrup is thick.

Peaches

Pare the fruit and proceed as above, using one-half cup of water to a half pound of sugar for the syrup.

Orange Marmalade

Use six oranges, one lemon, twice the weight of fruit in sugar, and twice the weight of fruit in water.

Wash the fruit well and cut first in half horizontally, then into very thin slices. Remove the seeds. Put into a porcelain bowl. Pour the water in and let soak over night. Turn into a saucepan and cook gently until tender —about one and one-half hours being required. Then add the sugar and cook gently until the rind is clear and the marmalade jellies when tested. (See Test for Jelly, page 114.) Put into sterilized glasses and seal.

Peach Sweet Pickles

Use 7 lbs. peaches, 4 lbs. sugar, 1 qt. vinegar, 2 oz. stick cinnamon.

Peel, or scald and rub, clingstone peaches. Stick four cloves into each peach. Cook sugar, vinegar, and cinnamon for twenty minutes, add the peaches, and cook gently until tender. Pack in jars and cover with the syrup. Seal while hot. Pickles, owing to the condiments used, are more difficult to digest than preserves.

MAKING JELLY

Experiment IV. To 2 tbsp. hot cooked fruit juice add 2 tbsp. absolute alcohol; stir and cool. If a gelatinous mass forms in bottom of dish, the juice contains *pectin.*

The juice of most acid fruit contains a jelly-like substance known as *pectin* or *pectose.* When the juice is cooked, a jelly is formed; if sugar is added the jelly forms before the juice is much reduced and a better flavor is secured. Jellies are more digestible than preserves. The general proportion of sugar to juice varies according to acidity. From three-fourths to one pound is the usual allowance for one pint of juice. If the juice is very watery the smaller quantity of sugar is used. If too much sugar is used, the juice will not jelly but will form a syrup. Fruit for jelly must be rather underripe, for if overripe there is too little pectose. Berries should not be used if they have been picked just after a rain, as they will then contain too much water. Overcooked jelly is apt to be somewhat stringy rather than firm and tender. From what fruits can you make jelly? What kinds cannot be so used?

The Jelly Bag. For making a jelly bag, use a piece of doubled cheesecloth.

* Plum Jelly

Use acid plums. Wash and turn them into a preserving kettle. Add just enough water to prevent their burning—not more than one cup to a gallon of fruit. Boil for twenty minutes, lifting them from the bottom to prevent sticking. When all the skins are broken and the juice runs freely stir well and turn into a jelly bag. Let drain over night into a porcelain bowl. Measure the juice and allow three-fourths pound of sugar to each pint of juice. Put the sugar into a moderately hot oven and leave until quite hot. Heat the juice and let it boil for ten minutes. Then add the hot sugar, and as soon as the sugar is melted, test. If it jellies, turn into hot sterilized glasses, and seal. Keep in a cool, dry closet.

CONVENIENT JELLY BAG

The Test for Jelly. As soon as the sugar is dissolved in the juice, put a spoonful of it on an ice-cold saucer in a cool place. In a few moments draw the tip of a spoon across the surface. If it makes a film or skin the jelly is done. If not, repeat the test almost immediately, as the jelly forms very rapidly. Jelly may also be tested by pouring a little from the spoon. If it breaks off in drops or flakes it is done.

Sealing Jelly. Seal jelly immediately by a cover of hot paraffin which has been melted in a small saucepan. As the paraffin shrinks a little when cool, the lid must be put on immediately and a strip of paper pasted over the joining of glass and lid.

Jelly from Berries

Wash and drain the berries. Warm on the back of the range until juice flows freely. Then mash through a sieve, drain through a jelly bag, and proceed as for plum jelly. Currants, blackberries, and dewberries may

be used in this way. In the west a sour little berry known by its Spanish name of *agrito* (that is, "the little sour one") grows, and may be used for jelly. Use just enough water to cover the bottom of the kettle and cook it very slightly, as the seeds give a bitter flavor.

QUESTIONS AND PROBLEMS

What is the food value of jellies and preserves? Do they fill the place of fresh fruits? What does a quart of preserves cost? Which is cheaper during the winter, preserves or apples? What does a glass of home-made jelly cost? How does this compare with that bought at the grocery? Read the label of the jelly purchased. Is it pure? What is glucose? (See Sugar, page 235.) Is it used in commercial jellies and preserves? Is your sample of jelly colored? What does your pure food law say about coloring matter and other adulterants in jellies and preserves? Give the test for jelly. Why heat the sugar? Tell how to sterilize jars and glasses. Why must jelly be sealed while hot? Have you ever seen any moldy jelly? Why did it mold?

Supplementary Recipes

Canned Corn with Tomatoes (p. 379)
*Canned Tomatoes (p. 379)
Canned Okra (p. 379)
*Canned Mixture for Soup (p. 379)
*Canned Sweet Potatoes (p. 379)
Canned Pumpkin (p. 379)
Canned Rhubarb (p. 380)
Canned Plums (p. 366)
Canned Pears (p. 366)
Canned Huckleberries (p. 367)
Canned Cherries (p. 367)
Watermelon Rind Preserves (p. 374)
Fig Preserves (p. 374)
Tomato Preserves (p. 374)
Wild Grape Jelly (p. 367)
*Apple Jelly (p. 367)
Apple Butter (p. 374)

CHAPTER VII

STARCHES

COMPOSITION OF CEREALS

	WATER	PROTEIN	FAT	CARBO-HYDRATE	FIBER	ASH	CALORIES PER LB.
Barley, granulated..	10.9	7.5	.9	79.8	.7	.9	1660
Cornmeal	10.3	7.5	4.2	65.9	10.9	1.2	1545
Rolled oats.....	7.7	16.7	7.3	66.2	2.1	2.1	1850
Cracked wheat.....	10.1	11.1	1.7	75.5	1.7	1.6	1685
Shredded wheat.....	8.1	10.5	1.4	77.9	1.7	2.1	1700
Macaroni	10.3	13.4	.9	74.1	...	1.3	1665
Flour, spring wheat.	12.3	11.7	1.1	74.5	.1	.4	1650
Flour, winter wheat.	13.3	11.	.9	74.4	.3	.4	1625
Graham flour.....	11.3	13.3	2.2	71.4	1.9	1.8	1670
Whole wheat flour...	11.4	13.8	1.9	71.9	.9	1.	1675
White yeast bread..	35.6	9.3	1.2	52.7	.5	1.2	1205
Cornstarch	....	....	...	90.	...	....	1675
Tapioca	11.4	.4	.1	88.	.1	.1	1650

The group of carbohydrates is divided into starches and sugars. The starches are found in fruits and vegetables, while an animal starch known as *glycogen* is found in liver.

Starch may be separated from different food stuffs, such as wheat, corn, and potatoes. Pure starch is a fine, glistening, white powder, seen in the form of cornstarch used for puddings and in laundry starch. Pure starch contains water and carbon.

How can we tell whether or not starch is present in a food? (See Experiment I, page 43.) What does starch give the body? Let us see if we can separate starch from the other materials in potatoes or cereals.

EXPERIMENT I. Grate a pared potato, and squeeze the pulp into a piece of cheesecloth held over a bowl, letting the juice settle. Then drain off the liquid, add a little water to the sediment, and boil. Test for starch. Examine the pulp left in the cloth—it contains much cellulose.

EXPERIMENT II. Rub a teaspoonful of oatmeal in half a cup of cold water for several minutes. Pour through a sieve. Boil the water and test for starch. (See Experiment I, page 43.)

EXPERIMENT III. Put the thinnest slice of raw potato you can cut under the microscope and note the appearance of the starch cells. Examine also cornstarch, laundry starch, and rice starch. Make drawings.

EXPERIMENT IV. Rub to a paste one teaspoonful of cornstarch mixed with a tablespoonful of cold water. Add one-half cup of boiling water. Stir constantly and bring to the boiling point. Stir until it thickens, and note thickness.

EXPERIMENT V. Stir one teaspoonful of cornstarch into one-half cup of boiling water and note the result. Break open one of the lumps formed. What is the condition of the starch inside the lump? Repeat this experiment, using flour.

EXPERIMENT VI. Mix together one teaspoonful of sugar and one of cornstarch. Pour over the mixture one-half cup of boiling water, stirring all the time. Does it lump? Why? (See Cornstarch Pudding, page 252.) Why do we use cornstarch or flour in sauces?

EXPERIMENT VII. Brown a little cornstarch or flour in the oven. Then repeat Experiment IV, substituting one teaspoonful of the browned starch for the raw cornstarch, and note thickness. Repeat, using browned flour. Compare the thickness of the mixture in Experiment IV with the one thickened with browned starch or flour. What effect has browning on flour or starch? If browned flour is substituted for raw flour in a sauce or gravy would more or less be used?

EXPERIMENT VIII. Cut a very thin slice from a washed and pared potato. Put it into a cup, and let water run over it for fifteen minutes. Then pour diluted iodine over it. Treat an unwashed slice in the same way and compare the colors of the two. Cook soaked and unwashed slices in different saucepans. Cover with the iodine solution and note the color. What food element is removed by soaking?

EFFECT OF COOKING ON STARCHES

Moist heat causes the starch grains to swell so that the coating of cellulose is broken and softened. After being softened and swollen, the starch is said to be gelatinized. This may take place below the boiling point but most starches are more thoroughly cooked by high temperatures. Raw starches cause much digestive trouble. Cook all starches thoroughly.

Dry heat changes starch to *dextrin*, a form of sugar that is very soluble. This change takes place in the crust of bread,

and for this reason the crust is more digestible than the center portion of a loaf.

Starch and flour (which is largely starch) are much used for the thickening or binding together of other foods, for example, gravies, sauces, and cream soups. In making white sauces, the chief end is to secure a smooth mixture without lumps, free from any gluey appearance and perfectly blended with the fat used. Sauces made by adding the flour to hot fat are not easily digested because the fat is overheated and each starch grain is coated with fat.

THE MAKING OF WHITE SAUCE

(Each group of two pupils is to use one-half of recipe.)

TABLE FOR WHITE SAUCE

KIND	BUTTER	FLOUR	MILK	USE
No. 1	1 tbsp.	1 tbsp.	1 c.	soups
*No. 2	2 tbsp.	2 tbsp.	1 c.	vegetables
No. 3	2 tbsp.	4 tbsp.	1 c.	creamed dishes, croquettes

EXPERIMENT IX. (For older pupils.) Repeat Experiment IV, using quantities given in table. Compare results. Repeat Experiment IX, using browned flour. How much browned flour would be needed to thicken sauce No. 2? Would this be a desirable consistency for sauces?

Reserve as much cold milk as there is flour to be added to the sauce. Scald the remainder of the milk. (See Cocoa, page 81.) Rub the cold milk with the flour until it makes a smooth paste. Add to it the scalded milk, stirring all the time. Return it to the double boiler and cook for fifteen minutes. Continue stirring until it thickens, then stir only occasionally. Add the salt and butter when ready to serve the sauce. It may be kept for half an hour or longer over hot water.

EXPERIMENT X. Thickening Power of Starches. (For older pupils.) Repeat Experiment IV, using cornstarch, also flour. Compare thickening power. Why do they differ?

EXPERIMENT XI. Let different groups add 1, 1½, and 2 tbsp. of cornstarch to boiling water, as in Experiment IV. When cold, note consistency. (See Cornstarch Pudding, page 252.) What is the proportion of starch in the pudding recipe? In Lemon Sauce? (See page 252.) Why is a large quantity of cornstarch objectionable? How much cornstarch equals one egg in thickening power? (See Custards, page 132.)

QUESTIONS AND PROBLEMS

Into what groups are carbohydrates divided? Of what use to the body is starch? What foods are rich in starch? What is the proportion of carbohydrates in your diet? What part of this is starch? Tell what you can of the digestion of starch. Why does cooking thicken a starch mixture? Why is cooked starch easier to digest than raw starch? Why should cereals be allowed to come to the boiling point before being put in the double boiler? How does dry heat affect starchy foods? Why is the crust of bread easily digested? What is meant by sauce? What is the appearance of a good white sauce? For what is it used? Tell how to make white sauce. What are the proportions for a thin sauce? A medium sauce? For what could each be used? What is the proportion of thickening in thick sauce? What is the best proportion of cornstarch to liquid for puddings?

THE CEREALS

TABLE FOR COOKING CEREALS

KIND	METHOD	QUANTITY	WATER	SALT	TIME	TIME OVER FLAME	BULK WHEN COOKED	COST PER SERVING
*Cream of wheat	Steamed in double boiler	1 c.	5 c.	1 tsp.	1 h.	10 m.		
Cracked wheat	Fireless cooker	1 c.	4 c.	1 tsp.	5 h.	20 m.		
*Rolled oats	Double boiler	2 c.	4 c.	1 tsp.	1½ h.	10 m.		
Cornmeal mush	On range or in fireless	1 c.	5 c.	1 tsp.	5 h. 10 h.	10 m.		
Coarse hominy	Fireless cooker	4 c.	4 qts.	1 tsp.	5 h.	½ h.		
Fine grits	On range	1 c.	4 c.	1 tsp.	1 h.	10 m.		
Rice, boiled	On range	1 c.	4 c.	1 tsp.	40 m.	10 m.		
Rice	Fireless cooker	1 c.	3 c.	1 tsp.	2 h.	5 m.		
Rice, steamed	Double boiler	1 c.	3 c.	1 tsp.	¾ h.	10 m.		
Rice, boiled and steamed	On range	1 c.	3 qts.	1 tsp.	20 m	20 m.		
Rice, boiled and drained	On range	1 c.	3 qts.	1 tsp.	45 m.	20 m.		
Macaroni	On range	¾ c.	2 qts.	1 tbsp.	Till tender 30-40 m.	All time		

(Review Experiment II, page 117)

Grains or cereals form a large part of our food. Bring samples of whole grains of wheat, rice, and corn. Compare their composition. Which class of food is abundant in all of them? Which cereal has the most protein? Fat?

In preparing most cereals for food the outer hull is removed and they are then cracked, crushed, or rolled; a few of them are used whole. Rice is an example of this. All cereals have a tough skin called cellulose that covers the starch grains. When cornmeal is sifted some cellulose is found in the sieve. This skin is very tough in corn; therefore mush, grits, and hominy need long cooking. Cereals are starchy foods, and therefore must be well cooked. Thorough cooking in boiling water also develops the flavor. If cereals are not well cooked they have a raw taste.

Serving Cereals. In warm weather rice and fine wheat preparations are the most suitable cereals to use as they are not rich in fat. In cold weather oatmeal, cracked wheat, cornmeal, grits, and hominy also are good. Cereals are served with milk or cream because the combination furnishes the food which our bodies require. Sugar is not needed, as cereals are largely composed of starch, which serves the same function in our bodies as sugar. If children have formed the habit of eating sugar on their cereals encourage them to use very little. Sprinkle it on with a sugar shaker.

Do not serve any sour fruits with cereals, even if you have sweetened them well, as acids interfere with the digestion of starches. Take a mouthful of dry toast now and then when you are eating cereals so that you will chew more carefully.

The Ready-to-Serve Cereals. In some ready-to-serve cereals only a part of the original grain is used, and their food value cannot be found except by chemical analysis. These preparations are usually more expensive than the cereals cooked at home. Compare cost and food value of a serving of a ready prepared cereal and of one cooked at home.

Steam Cooked Cereals. Rolled oats and wheat, and the fine wheat preparations have been steamed at the factory and do not need such long cooking as cornmeal, grits, and other raw grains.

Keeping Cereals. Pour cereals into glass jars and keep tightly covered in a cool place. Cereals containing fat grow rancid or musty in warm weather or when kept in a warm place. Test by smelling. If musty they are not fit for food. If a cereal has insects or little webbed balls in it do not use it, as the balls contain the eggs of insects.

COOKING CEREALS IN THE DOUBLE BOILER

*** Class Recipe 1 c. Water. (See Table, page 119, for Quantity of Cereal.)**

Measure the required amount of water. Put it into the upper kettle of the double boiler and place it directly over the fire. When it boils add the salt. Then sprinkle in the cereal a little at a time, so as not to stop the boiling. Stir briskly all the time, so that each little grain is kept by itself. If lumps form, the grains on the inside cannot swell and burst with the heat and will not be fit for food. The starch grains swell when heated just as popcorn does. Cereals must be added slowly to boiling water and cooked rapidly at first, then gently. If the cereal is about to run over, lower the heat or raise the pan from the flame. Do not strike the edge of the kettle sharply with your spoon as the metal will be dented or, if of enameled ware, chips will fall into the food.

Putting the Cereal to Steam. Boil cereal over the flame for five or ten minutes, according to the quantity; then add sweet, dried fruit if desired. Wipe the inside of the top part of the kettle, and smooth the cereal with a spoon. Cover and set the kettle over the lower part of the boiler and steam according to time given in the table. Put the lower kettle on to heat when you start the cereal to cooking. Fill it one-third full of water. Watch the lower kettle and add more boiling

water if it is in danger of boiling dry. When the cereal is removed, fill the kettle with cold water so that it may be easily cleaned. Cook all steamed cereals by this method.

COOKING CEREALS DIRECTLY OVER THE FIRE

Cornmeal, grits, coarse hominy, boiled rice, etc., should be cooked directly over the fire. Use a thick saucepan, and proceed as for steamed cereals, pushing the vessel to the back of the range, or lowering the heat instead of steaming over water.

Cooking Cereals in Fireless Cooker. Cover closely and cook over the flame as directed. When it is boiling briskly, put cereal on a very hot radiator in the fireless cooker.

* USING LEFT-OVER CEREALS

If any cereal is left from a meal, put it away carefully in a cool place, as it sours quickly; in hot weather keep in the ice-box. While still warm pour it into custard cups that have been dipped in cold water, filling each cup half full. When you are ready to serve, turn it into a cereal bowl. If you wish it warmed, turn it into a smooth pan, cover and put it into the oven or steam for about twenty minutes, and then lift with a spatula to the cereal bowls.

Browned Cereals

Turn grits, or any of the fine wheat preparations, or mush, while warm, into an enameled pan that has been dipped in cold water. When ready to serve, cut it into squares, dip into egg and crumbs, and place on well greased tins in a hot oven for fifteen minutes. Leave until it becomes a golden brown. Serve hot with meats or for breakfast with brown sugar or maple syrup.

Dipping into Eggs and Crumbs. Beat together one egg and two tablespoonfuls of cold water until well mixed. Dip the squares of cereal into flour, then into the egg, and then into fine cracker or bread crumbs. The cereal must be well coated with crumbs, but if too many are put on they will fall off and burn in the pan.

QUESTIONS AND PROBLEMS

How are cereals prepared for food? Through how many hands do they pass before reaching your table? Is the process of manufacture clean?

What is the composition of cereals? Review Experiment II, page 117. What food element is most abundant in cereals? What cereals are suitable for hot weather? What proportion of a serving of rolled oats is water?

What is cellulose? Review Experiments I and III, pages 116, 117. Why do most cereals require long cooking? How is the flavor affected by it?

Why do we serve milk or cream with cereals (see Composition of Milk, page 136)? Why is sugar not needed? Why serve dry toast with cereals? What fruits may be served with cereals? Why not serve acid fruits?

What ready-to-serve cereals do you use? How does the food value in them compare with that of home-cooked cereals?

What cereals could you prepare at home? Would it be convenient and economical to prepare them? What steam-cooked cereals do you use? Which requires longer cooking, cream of wheat or oatmeal? Why? What raw grains do you use? How does the time required for cooking them compare with that for the steam-cooked? Tell how cereal should be stored. How can you tell whether or not a cereal is good? Why does it grow musty? Why do you sprinkle the cereal into the boiling water slowly? What are the two important points in cooking cereals? What cereals would you cook in a double boiler? How much water is needed for one cup of oats? How much salt? What food elements in oatmeal? What food do we serve with it? What food elements in milk? What use could you make of left-over oatmeal, cream of wheat, or grits?

RICE

One of the most valuable grains is rice. It has not as much tissue building food as oats, wheat, or corn, but, like potatoes, it gives us energy producing food. Owing to the fineness of its cellulose it is easily digested. It may be used equally well as a cereal, as a vegetable with meats, instead of potatoes, and, cooked with milk and eggs and dried fruits, as a dessert.

Selecting Rice. The best rice has long, slim grains, as the short plump grains do not keep their shape when cooked. The broken rice, while not as attractive when cooked as the whole grains, has an equal food value and is cheaper. Rice should be free from dirt and weevils. The unpolished rice is better than the very white rice.

Cooking Rice. All rice needs careful washing. As some of it is coated with a kind of syrup and a fine powder known as talc, it should be washed carefully through three or four waters

by being rubbed between the hands. Rice may be boiled or steamed.

*** Boiled Rice (Class Recipe—See Table, page 119)**

2 c. water to ¼ c. rice, ¼ tsp. salt. (As evaporation is more rapid in a small quantity more water is needed.)

Use a broad shallow kettle for rice, and proceed as for cereals cooked over the fire. Stir twice at three minute intervals when first put into the kettle. When the rice thickens so that there is danger of its burning, put the kettle on the back of the range, or put an asbestos mat under it and lower the heat if over a gas flame. Then cover closely and let cook slowly until done

When the rice is done, all the water should be taken up, and each grain should be soft, but not mushy, and should stand apart from the others. If rice is stirred after it begins to soften, or if it is cooked in too thick a layer, it will be pasty.

Boiled Rice Drained. Use a rather deep kettle. Add one teaspoonful of butter or cream to the water before putting in the rice, and boil for twenty minutes. Turn into a colander and pour a quart of boiling water over it, and drain well. Put the colander in a baking plate in a moderately hot oven for fifteen minutes. Serve hot.

*** Steamed Rice (Class Recipe)**

¼ c. rice ¾ c. water ¼ tsp. salt

Cook in a double boiler as directed for cereals. Boil over flame for five minutes, then steam without stirring. When soft, lift lightly from bottom of the kettle with a fork and dry over a low heat by placing the upper kettle directly over the fire for a few moments.

Left-Over Rice

Use as directed for other cereals. Form into a steamed rice border for meats, use in a casserole for croquettes, for stuffing tomatoes or peppers, or in puddings.

QUESTIONS AND PROBLEMS

Where does rice grow? Have you seen it growing? What is the price of rice by the pound? What part of a pound is used in serving one person? How much water did you use in boiling one cup of rice in the first recipe? Measure the cooked rice. What is the difference in quantity? How long did you cook the rice? What is the chief food element in rice? How would you utilize left-over rice?

MACARONI AND OTHER PASTES

Macaroni, vermicelli, and spaghetti are all called Italian pastes. They are made from a kind of wheat that has more protein in it than common wheat has. Very good macaroni is made in this country from Durum Wheat. A mixture of flour and water is used to make these pastes. Macaroni cooked with cheese takes the place of meat; with butter or tomato it may be served with meat.

Good macaroni is a light grayish color and feels rough to the fingers. The sticks may be broken into short lengths without splitting. When cooked it holds its shape and swells to twice its former size. Macaroni that falls to pieces when cooking has been made from flour that contains too much starch.

* Boiled Macaroni (Class Recipe)

¼ c. macaroni 2 c. boiling water ¾ tsp. salt

Wipe the macaroni with a clean cloth, break it into inch lengths, and drop into boiling salted water. Boil until quite tender—about thirty or forty minutes. Test the macaroni by cutting a piece with the side of a fork—if it is perfectly tender, it is done. Pour it into a small sieve and drain. Then pour a quart of boiling water over it to wash off the loose starch. Why must it be thoroughly cooked?

* Macaroni with Cheese (Class Recipe)

1 tbsp. grated cheese
¼ c. boiled macaroni
3 tbsp. bread or cracker crumbs
4 tbsp. White Sauce No. 2 (See Sauces)

Butter two custard cups, using a bit of soft paper dipped in a little melted butter. Put a layer of macaroni in the cup and then a thin layer of grated cheese. Add more macaroni and cheese until the cup is two-thirds full. Pour in enough white sauce to cover it well. Sprinkle the top with crumbs and bake in a hot oven until the crumbs are a golden brown.

For home use take ¾ c. macaroni, 1 tbsp. salt, 2 qts. boiling water, 2 c. medium white sauce, ½ c. crumbs. Cook as directed above and bake in a pudding dish.

To Grate Cheese. Use a coarse grater and very firm cheese. If the cheese is soft, press it through a coarse sieve or slice it in very thin flakes.

Bread and Cracker Crumbs. Use stale bread, and roll on a board or grate on a coarse grater. If the bread is not crisp, dry in a moderate oven. Cool and then roll. If fine crumbs are needed, sift the crushed bread. Cracker crumbs may be prepared in the same way.

* Spaghetti with Tomato Sauce

½ box spaghetti or
1 c. broken in inch lengths
2 qts. boiling water
1 tbsp. salt

Wash and cook the broken spaghetti as directed for macaroni. If the long pieces are used, hold the sticks in a bunch and lower them into the water. As they soften bend them into a coil. Cook until soft. Then drain and pour a cup and a half of tomato sauce over them. One-half cup of grated cheese may be added to the sauce. Stir in the cheese and as soon as it melts pour it over the spaghetti. This will take the place of a meat dish.

* Tomato Sauce (Class Recipe ¼)

(Review Sauces)

2 c. of fresh or canned tomato pulp
2 slices carrot
1 slice onion
2 tbsp. flour
2 tbsp. butter
1 sprig of parsley

Chop the vegetables, add them to the tomato and gently cook for half an hour. Rub the tomato mixture through a coarse sieve, getting as much of the pulp through as possible. Put the tomato back into the saucepan. Rub the flour with three tablespoonfuls of cold water. When the paste is very smooth add it to the tomato and bring all to the boiling point. When it thickens, add the butter and salt to taste, and pour it over the spaghetti.

QUESTIONS AND PROBLEMS

From what are the Italian pastes made? Why does macaroni need to be well cooked? What kind of food is macaroni? Look at the table and see what percentage of carbohydrate there is in macaroni. Which has the more protein, macaroni or rice? Why not serve macaroni and cheese with meat? What brand of macaroni do you use? Is it good? How can you judge? Have you ever visited a macaroni factory? If so, tell about it.

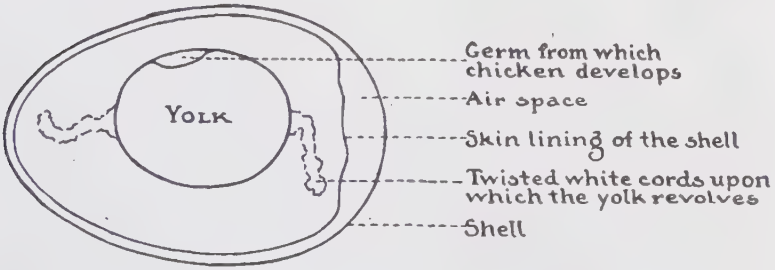
Supplementary Recipes

Coarse Hominy (p. 367)
Cracked Wheat (p. 384)
Rice Croquettes with Jelly (p. 359)

CHAPTER VIII

EGGS

Eggs have a very high food value. When served raw or properly cooked, they are especially good for the delicate and for children. When overcooked, however, they become tough and are not easily digested.



Composition of Eggs. Shell 11%. White 57%. Yolk 32%. The edible parts: water 73.7%; protein 4.8%; fat 10.5%; ash 1%. Calories per pound, 720. Yolk, 1680 Calories. White, 265 Calories. The yolk contains phosphorus, iron, calcium, magnesia, potassium. In the albumin there is sulphur, which gives bad eggs their distinctive odor. Egg white is 86% water, 12.3% albumin, and the remainder mineral. The yolk is 49.5% water, 16% protein, and about 33.3% fat. The remainder is made up of various minerals.

What food element is lacking? Compare the composition of eggs and milk. What foods do we serve with eggs? What is the food element in sugar? Is sugar used with eggs? When meat is served, which is the more appropriate dessert—a custard or pudding of milk and eggs, or fresh fruit? Why do eggs tarnish silver?

The Structure of the Egg. To break a fresh egg hold it with the small end down, and strike it a sharp blow with the blade of a knife. Turn it out of shell into a saucer and inspect carefully. Note the position of the yolk and the white, and the round spot in the yolk. This spot is the germ. (See cut, page 127.) When the egg is kept warm this germ begins to grow, forming the little chicken. In warm weather growth begins almost as soon as the egg is laid. Eggs can be kept only a short time, unless some very cool place is used for storage. Note, also, the lining of the shell. Observe the color of the white and the yolk, and the texture. In fresh eggs the white is firm and thick; in old eggs, somewhat watery. The color of the egg yolk depends on the breed of the hen which laid the egg and upon the food it ate. Hens on a varied diet, with an abundance of green food, lay eggs with darker yolks than those on dry food. A diet which is rich in milk gives a pale yolk.

(Upper left) a fresh egg, showing an even tint throughout; (upper right) a shrunken, but still eatable, egg with an increasing air-space at the large end; (lower left) a fungous, "spot" egg, seldom encountered in the kitchen; (lower right) a rotten egg, almost entirely black

Tests for Freshness. (1) The shell should be thick and rough if the egg is perfectly fresh. (2) Hold the egg between your eye and a very strong light in a dark room. (This test is known as "candling.") If the egg is clear it is fresh; if cloudy, it is old. If it shows a dark spot, it is in the process of incubation. The figure shows four eggs of different conditions as revealed by examination through a candler. (3) Drop the egg in cold water. A fresh egg will sink, an egg a little older shows a tendency to rise, and an old egg will float.

PRESERVATION OF EGGS

EXPERIMENT I. Boil an egg in a cochineal solution. What does the color denote? Egg shells are porous and must therefore be kept in clean places.

Factors That Influence Keeping Qualities. Since egg shells are porous, bacteria enter through the shell and the egg spoils. For the same reason the liquid evaporates and the egg becomes light. The following general instructions are therefore of importance, the first applying only to those who keep chickens:

1. Hens should be fed a clean mixed diet not too rich in protein. Keep the eggs clean by supplying clean nests for the hens, and collect the eggs every day.

2. If you buy eggs, choose clean ones with rough shells and of even color and size. If you cannot get clean eggs, wash and wipe them before putting them away.

3. Pack or wrap the eggs to exclude the air, laying small end down. (Why?) To exclude the air from eggs that are to be kept for a month or less, rub them, after they have been cleaned, with a cloth dipped in vaseline. Eggs may also be kept in a solution of lime water, but the flavor will be impaired. If eggs are to be kept for only a few days they may be wrapped in clean paper.

4. Whatever means is used for excluding the air, eggs should be stored in a cool dry place which is free from any strong odors.

PRESERVING EGGS IN WATER GLASS

Where eggs are to be kept for some time a solution of potassium silicate or sodium silicate known as *water glass* is the most satisfactory preservative. Only unfertilized eggs can be preserved in this manner, for in the fertile eggs the embryo or germ develops until the oxygen of the air in the shell is exhausted, then dies and decomposes. Eggs so preserved are apt to crack when cooked in the shell. The price of water glass varies, but it can be obtained from the wholesale drug dealers cheaper than at the retail shops. The average price is 25 cents a quart. One quart is enough for fifteen dozen eggs.

Make a ten per cent solution of water glass and boiled water. Cool before using. Use freshly gathered eggs and do not wash them before packing, unless necessary. A few may be put in the preserving fluid every day, as gathered.

COOKING EGGS

EXPERIMENT II. Fill a small saucepan half full of boiling water, place a small portion of egg-white in it, and boil for two minutes.

EXPERIMENT III. Into a like saucepan of boiling water put an equal quantity of egg-white. Let it stand for five minutes.

Note the condition of the eggs in each experiment.

Albumin begins to coagulate (harden) at 160° F. From 160° to 180° F. seems to be the best temperature for cooking eggs. Test the temperature of the water used.

* Soft Cooked Eggs

2½ qts. boiling water
6 eggs
salt to taste
½ c. cold water
2 tsp. melted butter
(Allow an additional cup of water for each egg added)

Test the eggs for freshness. If the eggs are very cold, they should be covered with warm water for five minutes before cooking. Place the eggs in a deep saucepan. Add the cold water to the boiling water and pour it over the eggs. Cover closely and let stand for five minutes. Take out the eggs, wipe and break. Hold the egg low horizontally over the cup or a slice of toast and strike across the center sharply with the blade of a knife, being careful not to drop bits of shell into the egg. Pull it open gently and let the contents slide into the cup or on to the toast. Add salt and butter, and serve immediately. Soft eggs are very unpalatable when cold.

To heat the cup, fill with hot water when the egg is put in water to cook.

Water Toast. Put a cup of boiling water into a small saucepan. Place it over the fire and add one-half teaspoonful of salt. Take a slice of toast on a fork and dip it into the water, removing immediately. Place it on a hot plate. Open the egg on it and add butter and salt. Serve at once.

* Poached Egg (Class Recipe, 1 Egg for Each Pupil)

Breaking Eggs. Strike the egg sharply with the blade of a knife. Hold egg near the dish, pull the shell apart, and let the contents slip out.

Only fresh eggs can be poached successfully. Put a small buttered

muffin ring into a saucepan that has been buttered, and cover with boiling water to which has been added one-fourth teaspoonful of salt to each cup of water. Break an egg into a saucer and slip it into the ring. (With skill the egg can be broken directly into the ring.) Cover the saucepan and put it in a warm place. If placed on a gas range, turn off the gas and leave it on a warm burner. The water must be deep enough to cover the egg. Let stand until the yolk is covered with a white film and the white is firm—from five to seven minutes will be required. Lift the egg and ring with a perforated skimmer, drain, and slip on to a round of buttered toast, and remove ring, or serve in a warm cup. Sprinkle with salt, pour melted butter over it, and serve. If pepper is used put it on the yolk only. Note the consistency of the yolk; compare with the white.

Egg Poached in Cups. Put a cup into a deep saucepan and cover with water prepared as directed above. Drop an egg gently into the cup, cover the saucepan, and let stand for five minutes or until the egg is jelly-like. Lift the cup and turn the egg gently on to a skimmer. Drain, and serve on toast or in the cup.

Separating Whites from Yolks. Break the egg over a bowl, turn the small end down, and pull the shell apart, slipping the yolk from one half of the shell to the other once or twice, so that the white will drop into the bowl. If any of the yolk is mixed with the white, the white will not beat well on account of the fat present.

Beating, Stirring, and Cutting and Folding Eggs. Three different methods of preparation of eggs are used for various recipes: beating, stirring, and cutting and folding.

Beating. Eggs are beaten to incorporate air. The yolks are beaten in a bowl, with a spoon or fork, or a dover egg beater. The whites are beaten on a flat dish or a platter, and are lifted so as to beat in as much air as possible. Use a whisk egg beater. Eggs are beaten stiff when, if cut by a knife, the cut does not close, and are beaten dry when bits of the egg fly off the beater. After eggs are beaten do not stir them, as the air will be forced out.

Eggs are beaten slightly to mix them as in French omelet, cup custard, and salad dressing.

Stirring. Eggs are stirred to mix them with other ingredients. In stirring move the spoon in a circle.

Cutting and Folding. This is the method by which sugar, flour, or other ingredients are added to beaten eggs. Sprinkle the substance to be added over the beaten eggs, then cut through with the edge of the spoon and turn the mass over. Repeat until the ingredients are well mixed.

TABLE FOR CUSTARDS

KIND	EGGS	MILK	SUGAR	SALT	FLAVORING
Firm Custard	4 to 6	1 qt.	½ c. or more	¼ tsp.	1 tsp.
*Cup Custard	1	¾ c.	2 tbsp.	⅛	Grating of nutmeg
Soft Custard	6 egg yolks or 3 whole eggs	4 c.	½ c.	¼	½ tsp.

Custards—General Proportions. From four to six eggs to one quart of milk, or one to one and one-half eggs to each cup of milk are required, as fewer than this will not give a firm custard. This may be varied by using the yolks, reserving the whites for a meringue. Custard made in this way, however, will not be so firm, even if double the number of yolks are used. Why? Cornstarch may be used instead of a part of the eggs. Allow one tablespoonful of cornstarch for each egg omitted. How does this affect the food value of the custard?

A firm custard made with four eggs to one quart of milk should be served from the dish in which it is cooked. When six eggs are used, it may be turned from the mold when cool or partially cool. A firm custard may be baked or steamed.

A soft custard is stirred constantly while cooking and is cooked over hot water.

***Cup Custard with Meringue**

See Table for proportions. One egg makes two small custards.

Scald the milk. (See Cocoa, page 81.) Break the eggs, separating the yolk from the whites. Put half the white with the yolk and beat slightly—that is, just enough to mix. Add the sugar and salt, and then the scalded milk slowly. Then add a grating of nutmeg or a tiny bit of orange peel. Pour into cups and set them into a pan of hot water. Bake

in a moderate oven until a knife inserted in the custard comes out clear. Do not let the water in the pan boil. Why? Cover with a meringue made of half of the egg-white. See directions below.

Meringue for Custards, Puddings, and Pies. Use one or two tablespoonfuls of powdered sugar for each egg-white. Chill the white, beat very stiff, then beat in sugar and flavoring. Spread or heap on the top of the custard or other dish, when cool. Place in a moderate oven and leave until a delicate brown color is secured. (About ten minutes will be needed.) Overcooked meringues shrink and become tough, if undercooked, the egg at the bottom liquefies. Set custards in a pan of cold water before returning them to the oven or they may be overcooked.

* Light Omelet (Class Recipe)

Use a very small sheet-steel pan, kept especially for the purpose.

1 egg	1 tbsp. water
$\frac{1}{16}$ tsp. white pepper	$\frac{1}{8}$ tsp. salt
1 tsp. butter	

Beat the yolk until thick and lemon colored. Beat the white until stiff and dry. Add water, salt, and pepper. Cut and fold in the whites. Heat the pan, put in the butter, and turn the pan so as to coat the bottom with butter. Pour in the omelet and spread and smooth it carefully. Cook over a very moderate fire until it is nicely puffed and is a delicate brown on the bottom. Place the pan on the center of the grate of a hot oven for a moment, to cook the omelet on the top. Test by touching with a knife or spatula. If it sticks, it is not done. When it is done, cut and fold, and turn on a warm platter. Have everything ready for serving the meal before making the omelet.

To Cut and Fold an Omelet. Take the handle of the pan in the left hand and, with a kitchen knife, cut a half inch gash into each side of the omelet near the center of the pan and at right angles to the handle. Tilt the pan forward until it is nearly vertical. Lift the upper side of the omelet and fold over very gently, so as not to break it. When folded turn on a hot platter and serve immediately.

French Omelet

(The French Omelet is one of the most difficult of egg dishes to cook.)

Use the quantities given above. Beat white and yolk together with a fork, just enough to mix them, about twelve strokes. Add the water and seasoning. Then proceed as for light omelet. Lift the edges with a spatula so that the uncooked portion may come next to the pan. When the whole is creamy, but not too firm, increase the heat so as to brown the bottom nicely. Fold and serve.

Vegetable or Meat Omelet

Fold into a four-egg omelet from one-fourth to one-half cup of minced ham, or chopped cooked vegetables, such as asparagus tips, peas, spinach, etc.

*** Hard Cooked Eggs**

Put the eggs into a large saucepan of boiling water, cover closely, and keep for one-half or three-quarters of an hour on the back of the range where it cannot boil; then drop the eggs into cold water to cool. Eggs cooked too long or at too high a temperature turn black about the yolk, because the sulphur is precipitated.

USING LEFT-OVER EGGS

Be careful to cook no more eggs than are needed, as they are not palatable when cold. Hard cooked eggs may be used at the next meal if kept very cold. Soft cooked eggs, if still unbroken, may be put into boiling water and cooked hard, then used for garnishing vegetables or salads, served in white sauce, or as Goldenrod or Stuffed Eggs.

Uncooked Whites. Egg-whites may be utilized for clearing soup or coffee, for white cakes and meringues, in puffed potatoes, etc. A meringue (See page 355) may be spread on thin crackers and cooked to a delicate brown in a moderate oven, then served warm or cold for dessert. If put in a cool place the whites will keep for several days.

Uncooked Yolks. The yolks may be covered with cold water and kept in the ice-box for twenty-four hours. Use for sauces, salad dressings, custards, bread, and cakes, or for scrambled eggs, adding one white to four yolks; or they may be dropped into boiling water, and when hard, may be mashed, seasoned, and used for sandwiches.

QUESTIONS AND PROBLEMS

What is the principal food element in eggs? What element is lacking? What is the caloric value of eggs per pound? How many of the size you use are required to weigh a pound? What is the caloric value of a pound of beef? Compare the weight of a serving of beef and one of eggs. The cost and food value. When beef round is twenty-two cents per pound, at

what price per dozen could you afford to substitute eggs? Write a breakfast or luncheon menu containing eggs. Is meat needed? Write a dinner menu containing little or no meat, using a dessert with enough eggs to make a balanced meal. Compare the cost and food value of eggs and meat for a meal for your family.

How does the white of the fresh egg differ from that of an old one? Why are fresh eggs required for poaching? What effect has the diet of the hen on the color of the yolk?

Tell how to select eggs. Give a test for freshness. Why is an old egg light? What does Experiment I show? Why do eggs spoil? What could poultry keepers do toward keeping eggs in good condition? Give a reliable method for preserving eggs.

How does the method of cooking affect the digestibility? What is the temperature for cooking eggs? How can a temperature below the boiling point be secured for eggs cooked in water? For custards?

Describe the process of scalding milk. Why is the double boiler used? When are eggs slightly beaten? What is the purpose of beating them? What is the object of beating them stiff? Describe the method of cutting and folding. Why are the custards placed in a pan of warm water? Arrange a plan by which you could steam your custard.

How many eggs will be required for a custard which uses one quart of milk? (See Custards.) Write a recipe for cup or soft custard requiring one quart of milk. Omit one-half the eggs and use cornstarch. How may cornstarch be added so that it will not lump? (See Experiment IV, page 117, and White Sauce.) How long must the milk and cornstarch be cooked before it is mixed with the egg? (See Cornstarch Pudding, page 252.) Compare the food value of this custard with that where the whole number of eggs is used. Which costs more?

Why does an overcooked omelet shrink? Why do omelets puff or rise? Why are they served immediately and on a hot platter? Write a recipe for omelet using four eggs. (Never try to cook more than this quantity at once.)

Describe the appearance of cold omelet. Mention several ways of using left-over eggs; eggs cooked in the shell; uncooked whites; yolks.

Supplementary Recipes

Soft Custard (p. 363)
Scrambled Eggs (p. 364)
Shirred Eggs (p. 364)
Stuffed Eggs (p. 364)
Goldenrod Eggs (p. 364)
Fried Eggs (p. 364)

CHAPTER IX

MILK

COMPOSITION OF MILK AND MILK PRODUCTS

	WATER	PROTEIN	FAT	CARBO-HYDRATE	ASH	CALORIES PER LB.
Milk	87.	3.3	4.	5.	.7	325
Skimmed milk	90.5	3.4	.3	5.1	.7	170
Cream	74.	2.5	18.5	4.5	.5	910
Butter	11.	1.	85.	....	3.	3605
Buttermilk	91.	3.	.5	4.8	.7	165
Cheese, full cream	34.2	25.9	33.7	2.4	3.8	1950
Cheese, cottage	72.	20.9	1.	4.3	1.8	510
Condensed milk, sweetened	26.9	8.8	8.3	54.1	1.9	1520
Cond. milk, unsweetened, or "Evaporated Cream"	68.2	9.6	9.3	11.2	1.7	780

Milk weighs a little more than water. One quart weighs two pounds two and one-half ounces.

Milk is one of the most important protein foods. It should be very clean as it is used by many people with poor digestion and if it is not pure it may do great harm. Before opening a bottle of milk, wash the bottle and top carefully and wipe dry. What is the composition of milk?

Color. Good milk is yellowish white and free from specks or streaks. The milk of some breeds of dairy cows looks whiter than that of others. Cows fed on dry feed do not give very yellow milk. Bluish milk is poor. There should be no sediment at the bottom after milk stands. Strain milk through cheese-cloth and see if specks of blood, or pus, or yellowish specks are found; if so, the milk is from cows with diseased udders; distinguish carefully between curdy specks and fat globules. Pure rich milk clings to the glass.

The Odor of Milk. Fresh clean milk is pleasantly sweet, with no trace of mustiness. Unpleasant odors may be caused by dirt in the milk or by the food of the cow.

The Taste. Fresh milk is slightly sweet with no strong taste. The flavor is spoiled by the same conditions that cause unpleasant odors.

Why Milk Sours. Milk sours because bacteria find their way into it from the dust, or from unclean vessels, and change the sugar to an acid. When sufficient acid is formed, the casein (sometimes called "curd") is curdled or made solid. The cleaner the milk, the fewer the bacteria. Milk produced under the best conditions may have as low a bacterial count as eight thousand per cubic centimeter (about 15 drops). Ordinary market milk has fifty thousand per cubic centimeter. Other bacteria than those that cause souring are found in dirty milk in great numbers. Such milk may decompose or spoil before it sours.

A poison known as ptomaine is sometimes found in milk, cream, buttermilk, and ice cream made from old or unclean milk and cream; it is very dangerous, and often causes violent illness or even death.

Keeping Milk. The two things to remember in keeping milk are: first, it must be kept clean so that few bacteria may enter it; second, it must be cooled quickly and kept cool, to prevent those bacteria that enter from multiplying rapidly. Milk may be cooled in ice water as soon as it is drawn from the cow, then kept in a very cool place. If you have no ice-box, wrap the milk vessel in a wet cloth. Tin and poorly glazed earthenware and vessels with seams or cracks should not be used for keeping milk; glass or semi-porcelain is best. Do not let milk freeze, and never mix warm milk with that which has been cooled.

MILK AS A CARRIER OF DISEASE

Milk contains the food upon which bacteria thrive, and as it is commonly taken raw we must guard our supply carefully. Cows sometimes have tuberculosis and the germs may be carried

in their milk. Not only the cows, but all workers in dairies, should be tested for tuberculosis. The germs of typhoid fever, diphtheria, scarlet fever, and some bowel diseases of young children may be carried in milk, if it is handled by persons who have the disease or who have been in contact with it. Never carry a milk bottle into a sick room. If there are any contagious diseases in the house, have milk bottles sterilized, that is, heated, so that all the germs are destroyed, before returning them to the dairyman. If there is danger of disease, or if one wishes to keep milk sweet for several days, it may be sterilized. Pasteurization, or the heating of milk to a temperature of 145-160° F., is adopted for the purpose of keeping it sweet. This process destroys the germs of some diseases, but can not be absolutely depended on to kill all germs. Milk should not be kept more than thirty-six hours after Pasteurization.

Sterilized Milk

Heat the milk to 212° F. and keep boiling for one hour. For long keeping, boil for three successive days, and seal. Milk so heated, however, is difficult to digest.

Pasteurized Milk

1. Fill both parts of the double boiler with water. The depth of the inner compartment should be such that when the bottles are placed therein the height of the water will be slightly above the height of the milk in the bottles.

2. Place the double boiler on the stove and put the bottles containing the milk to be Pasteurized in the water of the inner compartment. The tops of the bottles should be tightly stoppered with sterile non-absorbent cotton.

3. Place a dairy thermometer in the water. When the temperature reaches 150° F. (or when fine bubbles appear in the milk), remove the double boiler to the rear of the stove and allow it to stand covered for thirty or forty minutes.

4. The milk must be chilled quickly. Set the bottles in a large dish pan or bread pan containing cold water. A single bottle can best be quickly chilled by holding the side of the bottle under running water at such an angle that the milk is not spilled or the cotton plug allowed to become wet.

5. As soon as the milk is cold it should be set in the ice compartment of the ice-box until needed. All Pasteurized milk more than twenty-four hours old should be thrown away.

COMPOSITION OF MILK

Milk is a protein or building food, although it contains fat and carbohydrate in the form of sugar. The protein of milk is in the form of casein, with a little albumin. The next most important substance is fat. The fat varies with the breed of the cows, being from 3% to 6%. What breeds of cows give very rich milk?

There is about 5% carbohydrate in milk in the form of lactose (or milk sugar). The minerals in milk are very important; they furnish bone and muscle. They are phosphate of lime, phosphate of potash, and a trace of iron and citric acid, which may be considered with the minerals. Water forms about 87% of milk. Cow's milk is not a perfect food, although it is very valuable in the diet.

By a series of experiments milk may be separated into its various parts.

EXPERIMENT I. Observe a bottle of milk kept in a cool place over night; note the depth of the cream. In good milk from one-eighth to one-third is cream.

EXPERIMENT II. Keep a half pint of thick cream in a cool place for twenty-four hours. Cool to 55° F. and beat with a fork in a bowl. Churn in a small glass churn, or shake in a preserve jar until the butter separates. The grains should be about the size of grains of corn. Press gently to remove the buttermilk. Drain and wash the butter in clean cold water. Sprinkle on one-half teaspoonful of salt and work it in. Handle butter very lightly so as not to spoil the grain or texture. Weigh the butter. How much did it cost? What is the composition of the buttermilk?

If preferred, a quart of rich milk may be put into a bowl in a cool place until the cream rises and is quite thick. It may be skimmed and churned as directed above. Perfectly sweet separator cream may be churned, but the butter lacks flavor. Most persons prefer butter from well ripened sour cream.

EXPERIMENT III. Scald a half cup of milk. Note the skin that forms on the top of the milk; this is chiefly albumin. The protein of milk is hardened by a high temperature; for this reason it is heated over hot water. Milk scorches easily because of the fine particles of casein in it, and heating it over hot water prevents this.

EXPERIMENT IV. Put a quart of milk into a bowl and keep it in a moderately cool place until it clabbers or coagulates; turn into a thin

cloth bag and hang up to drain. After several hours place in a pan and put a weight on it; when firm remove from the bag and serve with cream and sugar. Note the consistency. What food elements have been lost in its preparation?

EXPERIMENT V. The water that drains from clabber is known as whey. It contains a little of the protein and some of the sugar of milk. Boil a portion of the whey. Let stand for a few moments. What can you say of the composition of the skin which forms?

EXPERIMENT VI. To a cup of fresh lukewarm milk add one-fourth of a rennet tablet, dissolved in one tablespoonful of lukewarm water. Let stand until it becomes firm; then compare with the curd in Experiment IV.

EXPERIMENT VII. Warm one cup of sweet skimmed milk to about 110° F. Add vinegar, a drop at a time, stirring constantly until it curdles. Let stand until the curd settles. Then drain off the liquid, filter, and boil. Skim it, let settle, strain through muslin; then filter the boiled liquid, and evaporate to dryness in a tiny pan. What is the product? Exhibit commercial milk sugar to classes.

THE DIGESTION OF MILK

The first step in the digestion of milk takes place in the stomach. It is then clotted or changed to curd by the action of rennet, a digestive ferment. (See page 49.) Sip milk slowly; the liquid of the mouth dilutes the milk and makes the curd less dense. Buttermilk and clabber are easier to digest than fresh milk, as the curd is finely divided. Very rich milk is not as digestible as that only moderately rich. Why? Owing to the ease with which milk is digested, it is very valuable in sickness, although in some persons it causes constipation. As milk does not form the poisons that other animal proteins do in the process of digestion, it is very useful when there is a tendency to rheumatism, gout, kidney diseases, and colds.

Milk should not be used with acid foods, such as fruits and fruit juices, as a dense clot forms that is not easy to digest. Only rich cream should be served with peaches or berries. Why?

THE COST AND FOOD VALUE COMPARED

If we consider the actual nutrients contained, milk even at ten cents a quart is not an expensive food. A quart of milk equals in food value three-fourths of a pound of meat, eight

eggs, or six ounces of bread. A five cent loaf of bread weighs from twelve and one-half to seventeen ounces. Bread, therefore, is a cheaper food than milk, but lacks protein. A glass of milk equals three ounces of lean beef or two eggs. With beef at eighteen cents a pound and eggs at thirty cents a dozen, milk at ten cents a quart is the cheapest food. A family of five can afford to use three quarts of milk each day.

If good milk is purchased at night the cream may be used for breakfast, leaving an abundance of skim milk of good quality for household use. If a quart of milk, which contains 4% of fat, is kept cool for eight hours or over night, the upper six ounces will form a 16% cream; the upper eleven ounces a 10% cream. The cream may be removed with a milk dipper or by syphon as shown in the figure, or it may be poured off. A pint of cream weighs sixteen ounces and costs the same as two quarts of milk, which would furnish twelve ounces of 16% cream or twenty-two ounces of 11% cream, and would leave skim milk for cooking purposes.

REMOVING CREAM WITH SYPHON

What is the fat content of your cream? What is the fat content of the milk you buy? What is the price of milk and cream in your market? Which will give you the more food value,—two quarts of milk at ten cents a quart or a pint of cream at twenty cents? Which would be of more value in your housekeeping?

Remember that milk is a food, not a drink. It takes the place of meat, beans, and eggs. It combines well with eggs, and if a moderate quantity of each is used, they will together equal a ration of meat or beans. It is particularly desirable for children up to twelve years of age, as it is quite readily assimilated. For supper or breakfast, mush and milk costs no more than bread and jam or molasses and forms a ration more in accord with the child's needs.

Skim Milk. For such foods as breads and cream soups, skim milk may be used to increase the amount of protein

in the diet. Sour milk may be used for making bread and cottage cheese.

Condensed and Evaporated Milk. This is canned milk from which a portion of the water has been removed. (Note difference in amount of water as compared with fresh milk.) Condensed milk ordinarily means milk to which cane sugar has been added. (See Table, page 136.) Such milk may be substituted for fresh milk in many cases, but the flavor is not that of the fresh article.

Evaporated Cream. This is usually condensed milk with no added sugar, and resembles cream only in appearance.

QUESTIONS AND PROBLEMS

Give tests for good milk. What are your state or city laws regarding cleanliness in dairies? Is there any inspection or test for tubercular or other diseased animals? Visit the dairy from which your milk supply comes. Is your milk supply clean enough to be used without Pasteurization? What diseases may be carried in milk? Is Pasteurization a safe remedy for all disease germs? Why does milk sour? How can souring be delayed? What conditions are favorable to the growth and spread of bacteria? (See Yeast, page 210.) Should cows be fed hay while being milked? How could the dust be lessened in dairy barns and pens? What is the bacteriological count for market milk in your town? What is meant by this term? If certified milk is sold, what is the difference between the bacteria permissible in it and in ordinary milk? Tell how we can keep milk. How can you air milk quickly so that it will not be exposed to dust? Give directions for washing milk vessels. What is the cost of milk in your home? Give the standards for milk and cream in your state. What foods do we find in milk? Why is milk scalded over hot water? Why not serve a pudding of milk and eggs after a meal with much meat? How may skim milk be utilized? What is its food value?

CHAPTER X

MILK PRODUCTS—CREAM—BUTTER—CHEESE

CREAM

Like milk, cream must be free from strong tastes or odors.

Gravity Cream. Cream obtained by letting the milk stand until the cream rises is known as gravity cream. (See Experiment I, page 139.)

Separator Cream. Centrifugal or separator cream is obtained by passing milk through a machine that turns the milk so rapidly that the fat is separated from the milk. Most cream sold in cities and towns is centrifugal cream.

Cream for Whipping. Use cream twenty-four hours old, if obtainable, as it is best for whipping. Fresh cream can be whipped, however, if rich and very cold. Pasteurized cream, if to be whipped, must be very thoroughly chilled. Cream held for two hours at a temperature of 35° to 45° F. should whip in sixty seconds. If cream is too warm it will become oily and turn to butter when whipped. Whipped cream will not keep as well as plain cream. (For Whipped Cream, see page 82.) What per cent of butter fat is in your cream?

BUTTER

Good butter must be sweet, firm, and of good grain; not oily. It must neither be streaked nor have specks of curd. It must not contain an excess of salt or water. What is the fat content of butter in your state?

CHEESE

In this country cheese is made from the milk of cows, but abroad the milk of sheep and goats is also used. Cheese is made

from the curd of milk. The curd is produced by adding rennet (a powder made from the lining of the calf's stomach) to the milk, or by allowing the milk to sour and curdle. (See Experiments IV and VI, pages 139, 140.) Most cheeses are made of the curd produced by rennet, but some Dutch and German cheeses are made from the sour milk. After the curd is pressed to remove the whey, salt and other flavoring materials are added and it is ripened, or stored until it has undergone certain changes in flavor due to bacterial growth. (What are bacteria?) The bacteria are probably in the dust of the air of the room where the cheese is made. Some cheese of peculiar flavor, such as Roquefort, can be made only in certain localities.

Cheeses are usually classified as cream, whole milk, and skim milk cheese. The cheese sold as cream cheese is often a whole milk cheese. Real cream cheese is made of whole milk to which a certain per cent of cream has been added.

Composition of Cheese. (See Milk.) Cheese is about ⅓ water, ⅓ fat, and ⅓ protein. A pound of cheese is nearly three times as nourishing as a pound of meat. Compare the cost. It is not as digestible as meat, owing probably to its density and to the quantity of fat it contains.

Selecting Cheese. Choose clean cheese of good odor. Examine it carefully to see that it is free from insects. Keep cheese in a cool dry place where flies and mice cannot reach it. It is very apt to mold if kept in a damp place.

*** Junket**

(Review Experiment VI, page 140)

2 c. milk	2 tbsp. sugar
½ tsp. vanilla	2 tsp. liquid rennet or
2 tsp. lukewarm water	½ a junket tablet

Heat the milk until it is lukewarm in a double boiler. Dissolve the sugar in it, and add flavoring, and rennet, soaked in warm water. Turn into a glass dish and leave it in a warm place (about 70° F.) until firm. Serve with cream. Flavor with nutmeg or cinnamon if preferred instead of vanilla. What is rennet?

Cooking Cheese. Cheese is made more digestible by being finely divided and lightly cooked with other substances.

EXPERIMENT I. Heat a tiny piece of cheese very hot in a saucepan directly over the fire, without letting it burn. Melt a like piece in a double boiler. Remove the boiler from the hot water as soon as the cheese is melted. Cool and note difference in the condition of the two pieces. Which do you consider the more digestible? Why? The protein in cheese is really the casein and albumin of milk, and it is toughened by high temperatures. It also contains fat which should not be overheated.

*** Cream Cheese on Toast (Class Recipe ¼)**

1 tbsp. flour	¾ c. scalded milk
¼ c. cold milk	1 tsp. butter
1 c. chopped or grated cheese	⅛ tsp. salt
a spk. cayenne or paprika	1 egg

Add the cold milk gradually to the flour, rubbing it to a smooth paste. Stir in the scalded milk gradually; then return to the double boiler and cook for ten minutes, stirring all the time until it thickens. Add the cheese and stir until it is melted. Add salt, pepper, the egg, slightly beaten, and the butter. Stir briskly for about one minute or until the egg thickens a little. Then pour it over a round or oblong of toasted bread or crackers. Serve immediately. *Do not let the water in the double boiler boil after the cheese is added.* Why?

Cheese with White Sauce

Proceed as in recipe above, using two tablespoonfuls of flour in sauce and omitting the egg.

Toasted Cheese on Crackers

Sprinkle a thin layer of grated cheese over thin crackers, dust with salt and cayenne pepper. Lay on a baking sheet, and place in a hot oven until the cheese is melted. Serve immediately.

QUESTIONS AND PROBLEMS

What is cream? Give directions for whipping cream. To what temperature should it be brought for whipping quickly? What is the proper temperature for churning? (See Experiment II, page 139.) Why is butter sometimes oily? When cream froths instead of turning into butter on being churned, what is the cause? (See Whipped Cream, page 82.)

What is the cheese standard in your state? (See Pure Food Laws.) What are the principal food elements in cheese? How does cheese compare with meat in food value? What is the price of cream cheese in your market? What skim milk cheese is offered by your grocer? Compare the price with that of full cream cheese. Which is richer in protein? What food elements have been lost in skim milk cheese? Make a list of the varieties of cheese in your market. Give price and state whether domestic or imported. Why should cheese be only slightly cooked? Describe the taste and appearance of overcooked cheese. If macaroni and cheese are cooked together, when is the cheese added? Why? Make a luncheon menu, using a cheese dish in place of meat.

Supplementary Recipes

* Churning (p. 351)
Buttermilk (p. 352)
Cottage Cheese (p. 356)
Frothy Whipped Cream (p. 356)
Cheese Soufflé (p. 357)
Welsh Rarebit (p. 357)
Cheese Bread (p. 357)

CHAPTER XI

MEAT

COMPOSITION OF EDIBLE PARTS OF MEAT AND FISH*

REFUSE AS PURCHASED	ARTICLE	CLASS	WATER	PROTEIN	FAT	ASH	CALORIES PER POUND
12.7	Porterhouse steak	Good	60.	19.5	19.5	1.	1270
8.5	Round of beef	Average	67.8	20.9	10.6	1.1	835
16.3	Chuck ribs	Medium fat	62.7	18.5	18.	1.	1105
16.5	Loin of veal	Medium fat	69.	19.9	10.8	1.2	825
18.4	Mutton leg	Medium fat	62.8	18.5	18.	1.	1105
	Gelatin		13.6	84.2	.1	2.1	1705
23.5	Pork, loin chop	Good	60.3	20.3	19.	1.	1180
13.6	Ham, smoked	Medium fat	40.3	16.3	38.8	4.8	1940
7.7	Bacon (no wrapper)	Medium fat	18.8	9.9	67.4	4.4	3030
25.9	Fowl	Medium fat	63.7	19.3	16.3	1.1	1045
41.6	Broilers	Medium fat	74.8	21.5	2.5	1.1	505
46.1	Red snapper (whole)	Good	78.5	19.7	1.	11.3	410
51.	Weak fish	Good	79.4	17.8	2.4	1.2	430
55.4	Black bass	Good	76.7	20.6	1.7	1.2	455
44.7	Spanish mackerel	Good	68.1	21.5	9.4	1.5	795
57.	Flounder	Good	84.2	14.2	.6	1.3	290
	Oysters	In bulk	88.3	6.	1.3	1.1	230

Carbohydrates, 3.3 in form of glycogen in liver.

The term meat includes the flesh of animals used for food. In this country the meats in ordinary use are: beef and veal, obtained from cattle; pork, the flesh of the hog; mutton, obtained from sheep; fish; and poultry, which includes chickens, ducks, geese, turkeys, the guinea fowl, and young pigeons, or

* The figures given are from Atwater's tables, Government Bulletin No. 28.

squabs. Another meat is game, which is the flesh of wild animals and fowls, such as venison (the flesh of the deer), the rabbit, squirrel, quail, dove, plover, duck, and turkey.

Our principal meat supply comes from the West and Southwest, and from Mexico and South America. As the country becomes more thickly settled the large cattle ranches are being turned into farms. This will eventually make the price of meat much higher, unless the farmers find some way of growing a cheaper food for cattle.

STRUCTURE OF MEAT

Upon examining a cut of meat, we find that it is made up of bone, fat, and lean meat or muscle. Have a shin bone sawed at its widest part near the joint. Note where it is spongy, and where hard. Note the fat, which in bones is called marrow, and also notice the tiny blood vessels. Bones are half water and of the other half two-thirds is mineral, chiefly lime, and one-third is animal substance known as cartilage. Bones are fastened together by thin, tough membranes, known as ligaments. Some of the animal tissue in bones is dissolved by heat and moisture.

By looking closely at some of the coarser cuts of raw meat one can distinguish the cord-like fibers. After boiling, these long stringy fibers can be torn apart. Under the microscope they will be found to be made up of tiny tubes, known as muscle fibers. These are of varying lengths, depending on the cut and the animal. In the breast of the chicken they are short, while in the coarser cuts of beef they are long. (In carving cut across the length of the fiber.) The walls of the tubes are made of an albuminoid substance. These tubes contain the muscle juice, which is water, that has dissolved in it proteins, minerals, and the substances which give flavor. When the tubes are cut the juice escapes and much valuable material is lost. Bundles of the tubes are held together by *collagen*, a substance which yields gelatin upon being boiled. This substance may be seen in soup meat that has been gently cooked till tender.

Exercise makes these connective tissues thicker; therefore the flesh is tougher in the parts that are much used.

Why is loin more tender than round? How does the wing of chicken compare with that of a bird in tenderness?

In the connective tissues between the meat fibers there is fat. Note the structure and appearance of fat in different cuts and animals, the quantity varying according to the animal and the part of the body. In chicken breast there is little fat, in the leg a greater proportion; young chickens have less than old, while in swimming birds there is a large quantity to give lightness and to keep them warm. Pork has more fat in its fibers than beef has. In some animals there is a large quantity of fat apart from the flesh; this is noticeable in pork, beef, and mutton.

COMPOSITION OF MEAT

Meats are proteins or tissue building foods, but contain also fats, mineral salts, and much water. (Note composition of different meats in table.) Phosphoric acid and potash are among the most valuable of the minerals.

Gelatin. Gelatin is made from the bones and connective tissues. It belongs to the nitrogenous group of foods, but is not a tissue builder as are the true proteins. Because of the gelatin contained, soup stocks and gravies become firm when cooled.

The Extractives. The juice of meat contains substances that give flavor, known as *extractives.* They are not considered nourishing, but stimulate the digestion. Soup meat is tasteless because the extractives have been dissolved in the soup.

USE AND DIGESTIBILITY OF MEAT

Meat is very important in the diet because it gives building material from which we can make new body tissue for growth and repair. (Name other foods rich in protein.) Owing to the poisons that may be left in the body, however, in the process of digestion (See page 53), we must not use too much meat.

Rheumatism and some other diseases are believed to come from an excessive use of meat.

Except when the stomach juices are weakened by disease, meat is easily digested, although the coarseness of the meat fibers, the amount of fat, and the method of cooking all affect the ease with which it is digested. A person with a delicate digestion might eat a tender broiled mutton chop from which the fat had been removed before cooking and feel no ill effects, while stewed mutton from a coarse cut rich in fat might cause acute gastric disturbances. Tender breast of chicken could be eaten by the invalid but the coarse fibered, strong flavored leg might cause much internal trouble.

Veal is dense in structure, and on account of its softness is swallowed before it is thoroughly masticated. For this reason it should not be eaten by children and invalids.

Pork is more difficult of digestion than most other meats because of its fat. Bacon fat is easily digested, although very salty bacon, and especially that which is treated with chemicals, is not digestible. Fish is not so easy to digest as beef, ranking with veal and mutton in this respect.

The liver, kidneys, and heart of animals, even when carefully prepared, are not so easily digested as the cuts from the flesh.

The sweetbread, as it is called, one of the digestive glands, is tender and of delicate flavor, but is believed to contain substances that are harmful to those of rheumatic tendencies. Canned, dried, salt, and smoked meats are not as easy to digest as fresh meats. Meat leaves little waste in the intestines, and so does not stimulate peristaltic movement; for this reason we eat with it coarse foods rich in cellulose, such as green vegetables.

THE PRESERVATION OF MEAT

Meat spoils or decomposes very quickly unless kept at a low temperature, dried, salted, treated with preservatives, or canned. All of these processes check the growth of bacteria or destroy them.

Cold does not destroy bacteria, but retards their growth. When the temperature is raised, the bacteria become active and the meat spoils quickly. If meat taken from cold storage is to be kept for more than a few hours, it must be placed in a very cold ice-box. The dish containing meat may be placed directly on the ice, and thus cared for the meat will keep a little longer than it will in the body of the box. If meat is to be kept several days, put it into an earthen jar which has been placed in a bucket of ice and salt. Thoroughly chill it, then repack in ice and cover closely. The jar needs repacking morning and night.

Bacteria may be destroyed by drying, a method much used for preserving meat in dry countries where ice is not available. The jerked or dried beef of the southwest is an example. Salt and smoke also destroy bacteria. Salt pork, ham, and breakfast bacon are so preserved.

Chemical preservatives are sometimes used on meat, but meat so treated is not healthful. (See the Pure Food Law.) Saltpeter, a chemical, is used to deepen the color of meat, but such chemicals are injurious.

Canning is another method of preserving meat, but canned meats are not usually made from the choicest animals. They are seldom cheaper than fresh meats, and are more difficult to digest.

Care of Meat. Meats must be protected from dust and insects. If meat is hung where there are flies, it should be placed in a thin cotton bag. Fresh beef may be kept without salt for two weeks in cold weather, and even in summer it will keep for several days in a good ice-box. What method do you use for the preservation of meat in your home?

Ptomaines. Unless meat is preserved by some of the methods given above, it decomposes or spoils very quickly. It is then a dangerous food because of the poisons formed. The poisons produced in decomposing animal proteins such as meat, milk, and eggs are known as *ptomaines*. They are very deadly, and may cause death in a few hours. Even a slight attack leaves

the system badly deranged. This poison forms quickly in fish and oysters and therefore one should be careful not to eat these unless they are fresh. Canned meats are sometimes a source of ptomaine poisoning.

Fresh meat can be easily distinguished from that which is even slightly tainted by the odor. Fresh oysters and fish have a very different odor from that of stale oysters or fish. It is not easy to detect decomposition in cooked meat, so that it is well to buy only uncooked meats in hot weather.

Cool all meats and soups as soon as they are done. Then keep them in a cool place. Never leave meats in a fireless cooker or in a warm oven after they are done. Do not keep cooked meats too long.

THE PURE FOOD LAWS REGARDING MEAT

The pure food laws prohibit the selling of the flesh of diseased animals, and of food that contains dirt or injurious preservatives. The enforcement of this law depends on the public. Do not patronize a dealer who infringes the law. If there were a rigid enforcement of the law, meat could not be transported through the streets uncovered, nor could it be exposed to flies, as it is in many shops. Cooked meats are often left open to flies and dust and are even cut on the uncleaned blocks that have been used for raw meats. Is this in accordance with the law?

A very common infringement of the law is the use of mineral preservatives in the form of powder sprinkled on meat. Another infringement is the use of coloring for sausage and other products, liquid blood being used to give a fresh look to old meats, while a brownish coal tar color is sometimes used. Sausage is frequently adulterated by the addition of bread crumbs, flour, and waste meat products, such as gristle.

QUESTIONS AND PROBLEMS

Study the reports of the Pure Food Commissioner and other state food regulations, and patronize those shops that are the cleanest and the most law abiding. Name some meat and meat products that lend themselves easily to adulteration. Carefully inspect your meat shop. Does it fulfill

the conditions of the law? How could it be improved? Write a list of the important requirements of a sanitary meat shop. Note provision for excluding flies and dust. Note temperature; odors; method of caring for cooked meat. Also note cleanliness of those who handle the meat. Does your pure food law forbid the sale of meat from tubercular cattle?

FOOD VALUE AND COST COMPARED

Meat, as we have seen, is one of the chief sources of protein or building materials. What are the other sources of protein? In considering the cost of meat compared with its food value the available protein is the basis of comparison, although the fat, also, is of high food value and must be considered.

Compare the per cent of protein of the different meats in the table on page 147. Compare the waste. Make a list giving price per pound of the cuts commonly used in your household. How do they compare in cost and food value? (See Table.)

SELECTING MEAT

In selecting meat one must consider: (1) the taste of the family with regard to kind and cut; (2) the cost, being sure to note carefully the amount of waste, such as bone, rind, and tough fiber, unclean pieces that must be discarded, or fat that cannot be used; (3) the fuel that will be required in cooking; (4) time and labor required for preparation.

The number of individuals in a family influences one in the choice of cuts and the method of cooking. Steaks for broiling should be comparatively thick; therefore, if the family is small a sirloin steak is too large unless only half of it is cooked at a time. A porterhouse, club, or Delmonico steak might be selected, for while the long thin end of the last is not available for broiling it may be utilized for stew or meat pie. A large roast may be used if carefully reheated in various forms.

In addition to the cut, there are certain standards of quality to be observed. The meat from fat animals is of higher food value and of better flavor than that from thin animals, as the per cent of water is lower. If a cut of meat is excessively fat,

there is, of course, a waste, but meat must be from a comparatively fat animal to be of the best quality. A cut from the round of the best beef is better than the choicest cuts of inferior animals. The flesh of young animals, such as veal and lamb, has a smaller per cent of fat than that of the more mature animals, so the standard that applies to the latter cannot be used for them.

Good meat is odorless except for a certain fleshy smell, not tainted, strong, or musty. Meat must be dry on the surface—thick, plump, and firm, but not hard to the touch or coarse in fiber; it should feel like velvet and should be easy to cut with a sharp knife. Frozen meat becomes soft and slimy unless carefully thawed and cooked promptly. The bones of old animals are white and hard; of young ones, reddish and soft. Good meat should be well marbled with fat; roasts and chops from mature animals should have a layer of fat on the outside from one-fourth to one-half inch thick.

Meats vary in color, fat, etc., according to their kind, so that in addition to these general rules for selection we must know the qualities of each variety.

Beef. Good beef is a rich bluish red when first cut, but grows brighter as it stands, becoming a bright cherry or a pale red within a short time after cutting. Very bright red beef may have been colored. Very dark, strong, coarse fibered beef with yellow fat is usually from old animals, and is not of good quality. A layer of straw-colored fat extends over the ribs and loin in good meat. The kidney fat should be white and crumbly.

Veal. Meat from calves is known as veal. Good veal is of a dull pink color; if very young, it is a light, bluish pink. It is softer than beef, and decomposes more rapidly, and so cannot be kept long.

Mutton. Mutton is a dull brick red, almost pink, with white fat, and like beef should be firm and dry. The bones are white. Almost any cut of good mutton is palatable if well cooked, but poor mutton cannot be made appetizing by the most skillful cooking.

Lamb. The flesh of young sheep is known as lamb, and ranges from a light pink to a grayish red. The bones are pink.

Pork. The pig, the flesh of which is known as pork, is more subject to disease than the sheep or the cow, so that its flesh is not so desirable for food. If pork is used, it should be carefully selected and well cooked. Pork from hogs kept in pastures and fed clean food is not apt to be diseased.

On account of its eating habits the hog is more often a carrier of parasites than are the grain eating animals. Some hogs are infested with a parasite commonly known as trichina. This parasite may enter the human system in raw or underdone pork, and may cause great suffering and even death. The only certain way of avoiding danger is by cooking all pork products thoroughly. Fortunately the per cent of infected hogs in this country is small.

The lean of good pork is pink and the fat is white. The meat of the medium-sized hog is more delicate in flavor than that of the heavy animal. For home use on the farm, hogs not more than one year old should be selected. Pork that is dull in color, with yellow spots scattered through the fat and lean is diseased. Liver, kidneys, and lungs of hogs are apt to be diseased. Ham and bacon are prepared from pork. Unsmoked bacon, known as salt pork, is much used for seasoning.

CUTS OF MEAT

The price of meat depends on the cut. A tender piece, of good flavor, that requires only a short time and little care in cooking costs more than a tougher piece that requires careful preparation and much time.

The beef is cut into halves lengthwise through the middle of the backbone, then into quarters known as fore and hind quarters; this division is usually made behind the last rib, but sometimes the last three ribs are left on the hind quarter. The portion in the middle of the animal, forming the loin on the hind quarter and the prime ribs on the fore quarter, furnishes the most tender meat.

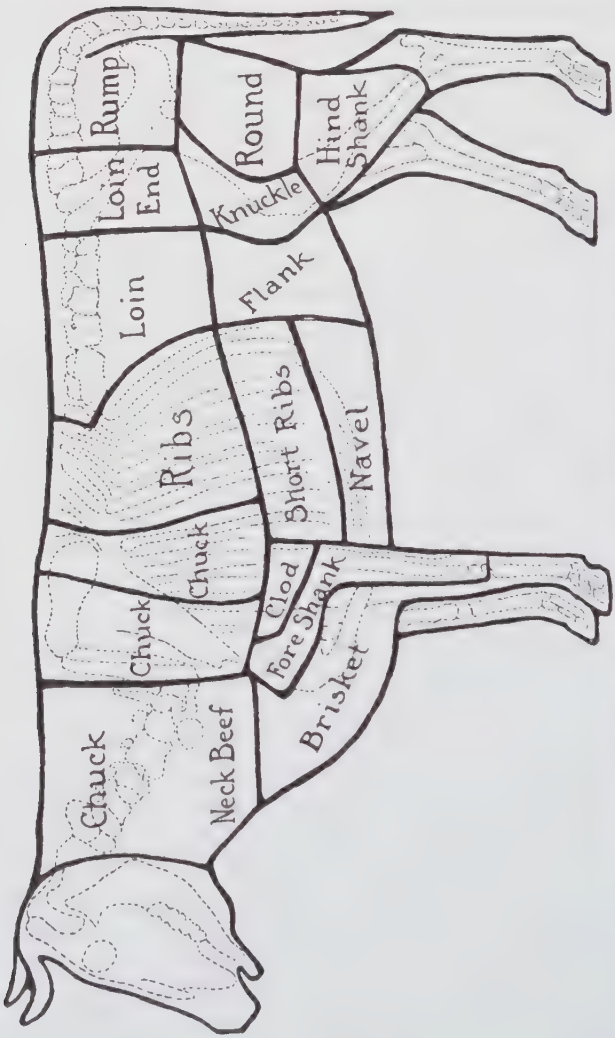


DIAGRAM SHOWING THE LOCATION OF THE VARIOUS CUTS OF BEEF

From the hind quarter the loin furnishes steaks and roasts; in young animals and sheep the loin is used for chops.

The ribs of the fore quarter of beef furnish choice roasts, and in mutton, lamb, and veal are used for chops.

The part of the animal that is used or exercised the most is the toughest. What part of the beef would be toughest? (See Figure, page 156.) What method of cooking should be used for this cut? (See Tables.) Study the pictures showing the cuts of meat, and tell why and for what purpose certain cuts would be selected. Would you choose beef, mutton, lamb, or veal? Why? When is mutton at its best in your market? Veal? Lamb?

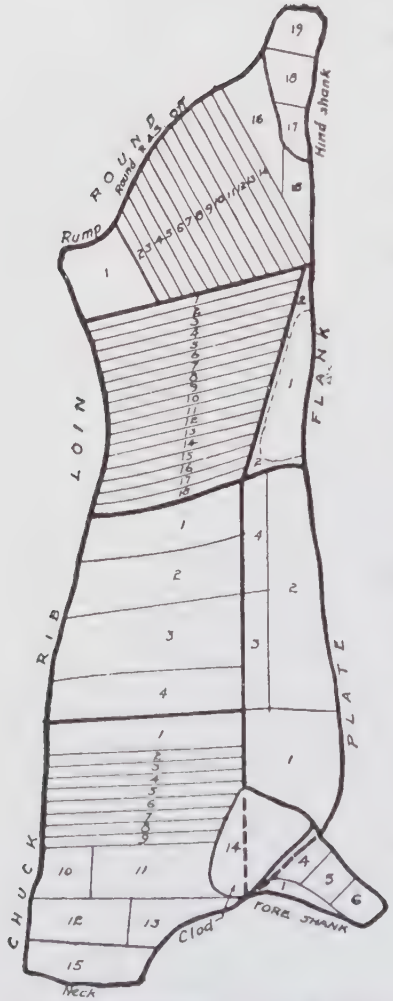
In the tables below, the meats are grouped as quick cooking, moderately quick cooking, and slow cooking.

The first group contains those meats that are adapted to broiling, pan broiling, sautéing (incorrectly called frying), or cooking in the oven after being dipped in batter or crumbs. Such meats must be comparatively tender and thin.

QUICK COOKING CUTS*

	WEIGHT, POUNDS	RETAIL PRICE, CENTS PER LB.
Porterhouse steak	1½ to 3	to
Club steak	1 to 2	to
Delmonico steak	1 to 3	to
Sirloin steak	2 to 5	to
Round steak	2 to 5	to
Top round steak	1½ to 3	to
Chuck steak	2 to 4	to
Flank steak	1 to 2	to
Veal steak	1 to 2	to
Pork steak	1 to 1½	to
Mutton chops	½ to ¾	to
Lamb chops	⅓ to ⅓	to
Veal chops	¼ to ¾	to
Veal cutlets	¾ to 1½	to
Pork chops	¼ to ½	to
Salt pork	1 to 3	to
Fancy breakfast bacon	⅛ to ⅛	to
Medium to fat bacon	⅛ to ¼	to

*This table and those found on pages 159 and 160 are reproduced by the courtesy of Prof. Louis D. Hall, of the University of Illinois, and by special arrangement with *Good Housekeeping*. The space under Retail Price may be used as a basis of class discussion, or may be filled in by the pupil.



HIND QUARTER

ROUND
- Rump
  - 1 Rump
- Round: rump & shank off.
  - 2 Round steak, first cut.
  - 3-13 Round steaks.
  - 14 Round steak, last cut.
  - 15 Knuckle soup bone
  - 16 Pot roast
- Hind shank.
  - 17,18 Soup bones
  - 19 Hock soup bone.

LOIN
- 1 Butt-end sirloin steak,
- 2 Wedge-bone sirloin steak.
- 3,4 Round-bone " "
- 5,6 Double-bone " "
- 7 Hip-bone " "
- 8 Hip-bone Porterhouse steak.
- 9-15 Regular "
- 16-18 Club steaks.

FLANK
- 1 Flank steak
- 2 Stew.

FORE QUARTER

RIB
- 1 11th & 12th Rib roast.
- 2 9th & 10th " "
- 3 7th & 8th " "
- 4 6th " "

CHUCK
- 1 5th Rib roast.
- 2-9 Chuck steaks
- 10-13 Pot roasts.
- 14 Clod
- 15 Neck

PLATE
- 1 Brisket
- 2 Navel
- 3,4 Rib ends

FORE SHANK
- 1 Stew.
- 2 Knuckle soup bone.
- 3-6 Soup bones.

DIAGRAM SHOWING CUTS OF BEEF IN DETAIL. (SEE TABLES, PAGES 157-160)

The second group comprises those meats that may be roasted or baked in a short time at a moderately high temperature. Like the meats for broiling, such cuts must be fairly tender, but are larger in size than those of the first group.

MODERATELY QUICK COOKING MEATS

	WEIGHT, POUNDS	RETAIL PRICE, CENTS PER LB.
Prime ribs of beef (first cut)	4 to 12	to
Prime ribs of beef (last cut)	4 to 12	to
Shoulder block roast	4 to 8	to
Chuck rib roast	4 to 10	to
Beef rump	4 to 12	to
Beef tenderloin (fillet)	2 to 6	to
Leg of mutton	6 to 9	to
Loin of mutton	3 to 6	to
Shoulder of mutton	3 to 6	to
Leg of lamb	3½ to 6	to
Loin of lamb	2 to 4	to
Shoulder of lamb	3 to 4	to
Crown roast of lamb	3½ to 6	to
Hind quarter (spring lamb)	5 to 8	to
Fore quarter (spring lamb)	5 to 8	to
Pork loin	2 to 8	to
Leg of pork	3 to 12	to
Ham (smoked)	3 to 12	to
Pork tenderloin	½ to ¾	to
Pork shoulder	2 to 5	to
Spare-ribs	½ to 1	to
Veal loin	3 to 6	to
Veal leg (fillet)	3 to 12	to
Veal shoulder	3 to 8	to

The third group contains those meats which require long slow cooking, and is subdivided into boiling meats, stewing meats, and soup and broth meats. Meats for boiling must be from rich, thick cuts of good flavor. The parts which are much exercised but which are not too bony make good boiling pieces. Meats for

stews must contain fat, fairly tender flesh, and some bone. Soup meats need a large proportion of bone.

SLOW COOKING MEATS

BOILING MEATS

	WEIGHT, POUNDS	CENTS PER LB. RETAIL PRICE,
Beef horseshoe piece (end round)	4 to 8	to
Beef shoulder clod	3 to 6	to
Rib ends of beef	2 to 6	to
Cross-ribs of beef	2 to 5	to
Beef brisket	3 to 8	to
Corned beef, rump, flank, plate or brisket	2 to 8	to
Beef tongue, fresh	3 to 5	to
Beef tongue, smoked	2 to 3	to
Leg of mutton	6 to 9	to
Shoulder of mutton	3 to 6	to
Shoulder of lamb	3 to 4	to
Leg of pork	3 to 12	to
Ham, smoked	3 to 12	to
Pork shoulder, fresh	3 to 8	to
Pork shoulder, smoked	3 to 8	to
Pork hocks	1½ to 2½	to
Back-bones and neck bones	2 to 8	to

STEWING MEATS

Beef plate	3	to 6	to
Beef flank	2	to 6	to
Drop tenderloin	1	to 2	to
Beef neck	1	to 3	to
Beef shin	2	to 5	to
Breast of mutton	2	to 4	to
Breast of lamb	1	to 2½	to
Veal breast	2	to 5	to
Veal neck	1	to 2	to

SOUP AND BROTH MEATS

Shin soup bones	1	to 4	to
Hind shank soup bones	1	to 5	to
Knuckle soup bones	3	to 7	to

	WEIGHT, POUNDS	RETAIL PRICE, CENTS PER LB.
Oxtail	1 to 2	to
Beef neck	1 to 3	to
Beef shoulder clod 1 to 2	1 to 2	to
Beef round	1 to 2	to
Mutton shoulder	1 to 2	to
Mutton neck	1 to 2	to
Mutton shanks	1 to 1½	to

QUESTIONS AND PROBLEMS

What are beef, veal, mutton, lamb, pork, ham, and bacon? What meats are sold in your markets? Where is your supply obtained? Is its transportation costly? Could your section produce its own meat?

What food elements are found in meat? What minerals? Of what value are they? Are meats expensive? Are they necessary? What foods may take their place? Compare the protein content of cooked dried beans, or macaroni and cheese, with roast beef, taking for a basis the quantity ordinarily served for a family. Compare broiled loin steak and omelet. Compare beef and milk bought for the same money.

What cut of steak would you buy for a small family? How would you use the tough part? Find the cost of loin steak, rib roast, round, and stewing pieces in your market. Compare the food value. Compare the cost of beef, mutton, and chicken. What meat would you select for a luncheon for your family during the winter? For dinner? What is the cheapest palatable cut you could use? Tell how to judge the cuts you selected.

Study the diagrams and locate the different cuts. What parts are most exercised? How would you cook these cuts? Why is the neck tough? How would you utilize it?

Make a list of the quick cooking cuts suitable for your family, and tabulate the prices. Make a similar list of slow cooking cuts. Compare prices and food value of meats on these lists.

COOKING MEAT

Meat is cooked to destroy parasites or bacteria, to develop flavor, and in tough meats, to soften the tissues. Is meat hardened or softened by cooking? The following experiments show the effect of water, heat, and salt upon meat.

EXPERIMENT I. Place a small cube of meat (lean beef) in a glass of water and let it stand for a quarter of an hour. Should meat be washed before being cooked?

EXPERIMENT II. Repeat Experiment I, first cutting the meat in shreds. Compare the results, noting the color. In which experiment was the more juice extracted? How would you apply what you have learned, to soup making?

EXPERIMENT III. Boil the water from Experiment II for five minutes. Note the result. Why does a scum form? (See Experiment V, page 140.) Read the recipe for beef stock (See page 173) and see if the principles brought out in these experiments are applied.

EXPERIMENT IV. Put a small cube of meat into a hot frying pan. Turn every ten seconds until well seared. Then lower the heat and turn less frequently. When done compare with the meat in Experiment V.

EXPERIMENT V. Put a like piece of meat into a cold frying pan and heat slowly for three minutes. Then turn and cook for three minutes longer. Compare with the meat in Experiment IV.

EXPERIMENT VI. Sprinkle a small piece of meat with salt. Let stand for five minutes. Note results.

EXPERIMENT VII. (a) Heat meat and water in Experiment I slowly to boiling point and boil for three minutes.

(b) Cover like piece of meat with boiling water and boil for three minutes.

(c) Sear a third piece in an ungreased pan until browned; then proceed as in (b). Cut open cubes and compare. Compare the broths. Which method is best for stews?

From these experiments we conclude that less juice is lost when the meat is quickly seared, as the protein on the surface of the tubes is coagulated and the juices are kept in. Broiled meats cooked slowly lose their juices and become tough. For tender meats, quick cooking with a prompt searing gives the best results. Meat for broiling must not be beaten, as the juice will escape. Why? For tough meats the surface must be seared promptly to retain the juice as far as possible, then the cooking continued at a low temperature, usually in the presence of water to lessen shrinkage. The juices are served with the meat. In soup-making the object is to draw out the juices, hence the meat is cut into small pieces and soaked in cold water before cooking. Browning meat develops a very appetizing flavor, so a part of the soup meat is browned in a little marrow. Soup made altogether of unbrowned meat has a raw taste.

Frying is not a good method of cooking meat, since the sur-

face of the meat is so coated with fat that the action of the gastric juice on the fibers is restricted. The high temperature needed for frying develops irritating acids in the fat, and this makes another disturbing factor. A third objection is found in the overcooked condition of much fried meat. Overcooked meats are not palatable, are very indigestible, and have lost a part of the food value. Meat may contain parasites, however (for example, trichina in pork), or bacteria that may be the germs of disease, so it must be cooked enough to destroy these if they are present.

Preparing Meat for Cooking. As soon as meat is brought in, the wrapping paper should be removed and unclean pieces should be cut off. Then until it is ready to be cooked, leave it in a cool, clean place, protected from flies or other insects. When ready to cook, wipe with a clean cloth wrung from cold water and trim off any tough membranes. If the meat is to be coated with flour or crumbs, as in roast or breaded chops, salt just before putting on the coating. Have the fire ready and the pan hot before salting. Do not salt broiled meats until just ready to serve. Why? (See Experiment VI.)

BROILING MEATS

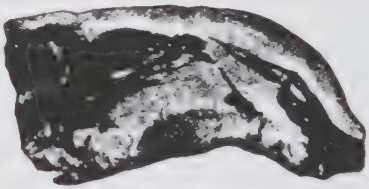
The term broiling means cooking by direct exposure to hot coals. This method develops a flavor that cannot be secured by any other means. It is probable that the flavor of meat broiled over the coals is due in part to the supply of oxygen. Broiling is also done under the gas flame. The new gas broiling ovens have perforated doors that admit air, and meats cooked in them are very palatable. *Pan broiling* is cooking in a very hot pan with no fat, or in one slightly greased.

Tender portions of beef, lamb, and mutton, and young chickens, squab, quail, doves, small fish, and oysters may be broiled. The red meats may be served rare, but white meats must be well done. Chicken or fish served rare is very unpalatable.

To broil meat the fire must be very hot at first, in order to sear the surface rapidly and retain the juices. The meat must

be turned every ten seconds for the first three minutes, for if it is not seared rapidly and turned often much juice is lost. After three minutes lower the heat or lift the broiler higher above the coals and continue the cooking from three to eight minutes longer. A steak one inch thick will require six minutes, if to be rare, or nine or ten minutes, if to be well done. A very thick steak requires from ten to twelve minutes. The pan or broiler must be lightly greased with suet, bacon fat, olive oil, or lard,—never with butter. Why not? Do not prick the meat with a fork when turning, but lift with a thin broad knife or

HIP-BONE SIRLOIN STEAK



REGULAR PORTERHOUSE STEAK

spatula. Why? Turn the steak on edge to brown fat, or thick edge, or bone. Why should broiled meat be turned frequently?

If the cooking continues too long, the tissues shrink and become hardened and the steam escapes. A broiled steak should be brown, and is light and puffy on account of the steam inside. As it cools the steam condenses and the steak becomes flat. It should be served on a warm platter and the dinner plates, too, should be warm. Never salt steak before broiling it. Why? (See Experiment VI.) When the steak is done, sprinkle with salt and pour over it a little melted butter or any desired sauce; then serve immediately. Other meats may be broiled in the same way, the time being varied according to thickness.

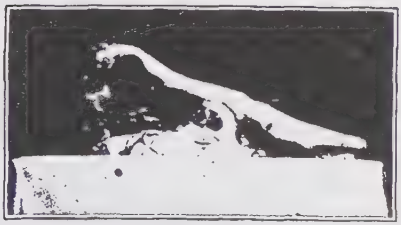
Steak Broiled Over Coals

Select a small Delmonico steak. Trim off most of the fat and cut off the flank end. (How may it be used?) Cook in the broiler over glowing coals. (Review Broiling.) Broil as directed, keeping the fat end of the steak to the open end of the broiler so that the fat will run over the meat. Serve with melted butter and garnish with parsley and slices of lemon. For

a sick person remove all fat, and grease the broiler very lightly. If a charcoal grill is used lay the steak on the hot, well greased bars and turn as directed. Regulate the heat by raising or lowering the grill or by banking or lowering the coals.

Steak Broiled Under Gas Flame

Heat the oven and broiler very hot, greasing the broiler well. Lay the steak on the broiler and close the door. Proceed as directed for broiling over coals, turning frequently at first. The meat may be put in a short handled broiler for ease in turning, then laid on the rack under the gas flame.



DELMONICO, INCORRECTLY CALLED CLUB STEAK

Broiled Lamb Chops (Class Recipe—One Chop)

Broil in pan or broiler. Cook from eight to twelve minutes, according to thickness. Remove most of the fat from mutton chops. Sear over edges and bone well.

*Pan Broiled Steak (Class Recipe—One Small Piece of Steak)

Pan broiling is a quick and convenient method of cooking. A sirloin, porterhouse, club, T-bone, or Delmonico steak, each about one and one-fourth inches thick, is suitable for pan broiling. Inspect the steak and note the quality and the distinguishing marks of each cut, noting bones and making drawings if time permits. After the steak has been inspected, wipe with a cloth wrung out of cold water and remove most of the suet. (The narrow or tough end of a steak can be used in stew or meat pie at some other lesson.) Mashed potatoes may be prepared to serve with the steak.

Heat a small frying pan very hot. Rub with suet, greasing well. Put in the bit of steak, count ten, turn the steak, and continue turning every ten seconds, keeping it over a hot fire for about three minutes. Then reduce the heat and turn less frequently, cooking from six to ten minutes in all. Hold the bit of meat between two forks or knives and sear all sides so the juice will not escape. Have the serving plates slightly warmed and ready for the steak, which should be sprinkled lightly with salt and spread with a little melted butter. Melt the butter slightly over hot water. Why? (See Fats.) In broiling a large steak for home use, drain the fat from the pan frequently.

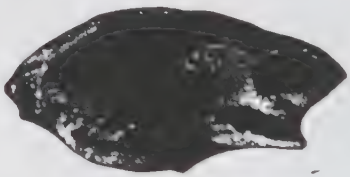
***Hamburg Steak Pan Broiled (Class Recipe—Two Meat Cakes)**

Select a thick round steak, about one-sixth as much suet, and a small piece of chuck or neck. If the steak is cut too low on the round, it will contain many tough fibers which cannot be used.

Inspect the meat, comparing its structure with that of the steak used in the previous lesson. What is the most striking difference between them? Note the appearance of the bone in round steak. Which contains the greater amount of bone, a cut from the upper or the lower round? Compare the round and chuck in appearance and available meat. What is the price per pound? Cut the meat in strips about one and one-half inches wide,

ROUND STEAK

The part above the dotted line is known as the "inside" or "top" and is much more tender than the lower half.



ROUND-BONE SIRLOIN STEAK

discarding the tough fibers. Then grind in a meat chopper, putting in a bit of the suet now and then. Use in all about one-sixth as much suet as meat. Form a small round cake of the meat one-half an inch thick, and not very broad, as large cakes break in turning. Prepare the pans as for pan broiled steak, greasing liberally. When the pan is very hot, put in the steak and turn as soon as it is slightly firm. Turn frequently with a spatula, and cook as directed for pan broiled steak. When it begins to brown, lower the heat slightly, and cook for eight or ten minutes. Then place on a hot platter that has been rubbed with a slice of onion. Season with salt and pepper, garnish with parsley, and serve immediately. Serve steamed or boiled rice with the steak and brown gravy or tomato sauce. (See page 126.) How many pounds of meat were used? How many cakes were made from it? How many cakes would be required for each person for luncheon? How much would enough Hamburg steak for your family cost? Compare the cost of Hamburg steak with that of the pan broiled steak.

Breaded Hamburg Steak. Proceed as above, then prepare as Breaded Mutton Chops (see page 370), cooking in a hot oven for fifteen minutes.

*Brown Gravy (Class Recipe for Group of Four)

(Review Experiments IV and VII, using flour.)

½ c. hot water or stock
1 tbsp. browned flour
1 small cake of cooked beef
1 tbsp. fat from roast or soup
1 tbsp. cold water

Cook the cake of beef gently in the water or stock for fifteen minutes. Rub the flour to a paste in the cold water and add it to the gravy. Bring to the boiling point. Add fat and seasoning, and serve.

*Broiled Breakfast Bacon

When the bacon is unwrapped inspect it carefully, remove any mold, and put it in a cool, dry place. Before slicing the bacon wipe with a damp cloth, then peel off a thin outside layer on the flesh side, and cut into thin slices. Use a sharp, thin bladed knife. The bacon must be cold to cut well. When it is all cut, slip the knife next to the skin and remove the slices. Look at the ends of the slices. If the fat is very strong and yellow, cut it off. Fat exposed to the air in a warm place becomes rancid. Why does rancid fat disturb digestion? (See page 225.) Place the slices of bacon in a frying pan over a moderate fire and cook until it is clear and brown, turning occasionally. If cooked until crisp, it is not easily digested. The bacon may be placed in a fine wire broiler, then over a baking pan, and cooked in a hot oven, turning it once and draining it on paper. Plain salt bacon does not brown well, but if soaked in milk for thirty minutes both color and flavor are improved.

Pork Chops (Class Recipe)

Pork requires longer cooking than other meats in order to destroy parasites that may be present. If cooked too rapidly, the outside will be dried before the inside is thoroughly heated.

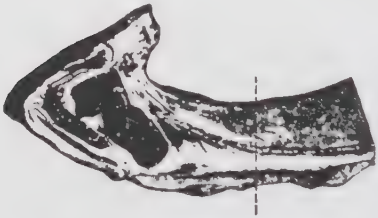
Pork chops may be pan broiled or cooked in the oven. To cook chops in the oven, lay them in a baking pan and put them in a very hot oven for ten minutes, then sprinkle with salt. Lower the heat, baste every fifteen minutes with a little of the pork fat, and cook for three-quarters of an hour from the time that they were put into the oven.

ROASTING OR BAKING MEATS

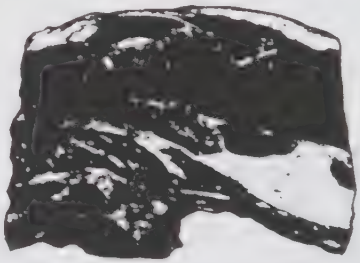
The term roasting has come to be applied to meats cooked in the oven, but in its original meaning it referred to meats hung before an open fire and turned frequently. The process we term

roasting is really baking. As in broiling, the purpose is to retain the juices by a quick searing of the surface.

Meat for roasting should be fairly tender. The loin, rump, and rib roast are preferred in beef, but the brisket may be roasted if taken from a choice animal. Good roasts of lamb or mutton are the leg, the crown roast, and the saddle (a cut from the loin before the carcass is split). Shoulder and ham of pork furnish good roasts, while almost any poultry and game may be roasted unless very tough. Fish is also roasted or baked.



STANDING RIB ROAST. BONE MAY BE CUT ON DOTTED LINE



SHOULDER POT ROAST

Trim off the ragged edges, but do not remove the fat. Select a pan that is just big enough for the roast, for if there is much exposed pan surface the gravy will have a burned flavor. Put a low rack in the pan, dredge (sprinkle) the meat well with flour if preferred, or roast without doing this. Place the meat on the rack with the largest cut surface up, and if possible with the fat where it will run over the meat as it melts. Some bits of fat may be detached and laid over the meat. Put the pan into a very hot oven (450° F.) for fifteen or twenty minutes; if the meat, when first put in, is very cold, half an hour may be needed. Then reduce the heat to 340° F. or to what is considered a moderately hot oven, if there is no thermometer, and cook from fifteen to twenty minutes to the pound, according to the shape, weight, and tenderness of the cut. After the first half hour, pour a little boiling water into the pan, not enough to reach the meat, however, and baste the roast every fifteen minutes with

melted fat and water. (Meat is basted by pouring fat over it to keep the crust from becoming hard and dry.) The water keeps down the temperature of the fat so that it may be used for gravy without causing digestive trouble. If the water evaporates it must be replenished. Some cooks do not use water, but if the gravy is to be eaten it is more digestible when this plan is followed.

The essential points in roasting meat are: first, a prompt searing of the surface so that the juices are retained; second, frequent basting, for if this is neglected the outer part of the meat will be dry and tasteless. Good roast meat should have a crisp brown crust, and a tender juicy center, and should be brown on the outside edges, shading to a pink in the center. Pork and poultry should not be served rare.

*Roast Beef With Potatoes

Select a rib or loin roast. Prepare the roast as directed, first dredging well with flour, then searing on all sides. Reduce the heat and cook at a moderate temperature.

Pare white or sweet potatoes and boil for ten minutes. Drain and put into the pan with the roast forty minutes before the meat is done. Baste potatoes well when the roast is basted. Serve with brown gravy.

Gravy for Roast

1½ c. stock or other liquid	4 tbsp. browned flour
4 tbsp. fat from roast	salt and pepper

Pour the liquid from the roast into a bowl, removing as much of the fat as possible. Measure the liquid and add enough water or stock to make one and one-half cups. Put the liquid into a saucepan, and add the flour rubbed to a paste with a little of the liquid that has been cooled. Stir until it thickens, then add the fat and stir until it reaches the boiling point. Then season and serve.

BOILING MEATS

Meats for boiling must be of rich flavor and in solid pieces, the amount of water used depending on the condition of the meat. If salt or smoked meats are to be cooked, a large quantity of water is used, but for fresh meats less is needed.

As in broiling and roasting, a coating is formed over the meat, due to the coagulation of the protein by the hot water, and the juices are thus well retained. After the first few moments of rapid boiling, the heat is lowered to prevent hardening and shrinking of the fibers. The cooking is then continued from three to five hours or until the meat is tender.

Boiled Leg of Mutton

A leg of mutton that is too tough for roasting may be boiled. Put the meat into a kettle of suitable size, pour the boiling water over it, and boil for five minutes. Why? Then lower the heat and barely simmer till tender, about three hours. Add a tablespoonful of salt for each quart of water when the meat seems to be getting tender. Serve hot with caper sauce, or cold with any preferred relish.

The water in which the meat is cooked may be utilized for broth unless of very strong flavor.

Caper Sauce

1½ c. mutton stock	3 tbsp. flour
⅓ c. butter	½ c. capers
½ tbsp. salt	a few grains cayenne pepper

Mix three tablespoonfuls of the cold stock with the flour. Bring the remaining stock to the boiling point. Add the flour mixture. Cook until smooth and thick, stirring constantly. Remove from the fire and add butter, salt, and well drained capers.

STEWING AND BRAISING MEATS

Review Experiment I.

Tough, juicy meats are braised, stewed, or pot roasted. (See Table, page 160.) The object in cooking them is to sear the surface enough to retain a part of the juices, then to soften the tissues by a long continued heat, with water added to prevent drying. After the first searing the heat must be lowered. The gravy contains much of the juice and is served with the meat. Meats for stews should contain fat, fairly tender flesh, and some bone.

Stews should be of good flavor and tender. Do not cook until the meat falls to pieces, the proper time being from two to three hours. The gravy should be thickened to about the con-

sistency of medium white sauce. Stews are very attractive if served in a border of cooked rice or mashed brown potato. Potatoes cut in cubes and boiled may be arranged around the platter and the stew served in the center. A stew may be made into a meat pie (See Chicken Pie, page 358). What cut would you select for stew?

***Irish Stew (Class Recipe ⅕)**

(Review Experiment VII.)

2 lbs. meat	1 qt. soup stock or cold water
2 slices onion	salt
1 carrot	flour
4 to 6 white potatoes	

(In the lesson on Irish Stew, one class may carry out the first part of the process, and another class may complete it.)

A fireless cooker is adapted to stews.

Remove a part of the fat if necessary, and cut the meat into two-inch cubes. Sear coarse pieces of meat and bone slightly as for broiling. Cover with soup stock or water and bring gradually to the boiling point. Sprinkle the remainder of the meat with salt, roll in flour, and drop into the boiling stew. Boil for five minutes, cover closely, and let simmer until tender—about three hours. After the first two hours add the onion and carrot. When the meat is tender, add the potatoes, pared, and boiled for ten minutes. Cook till tender, then add salt to taste, and serve. If preferred, potatoes may be cut into cubes.

Brown Stew with Dumplings

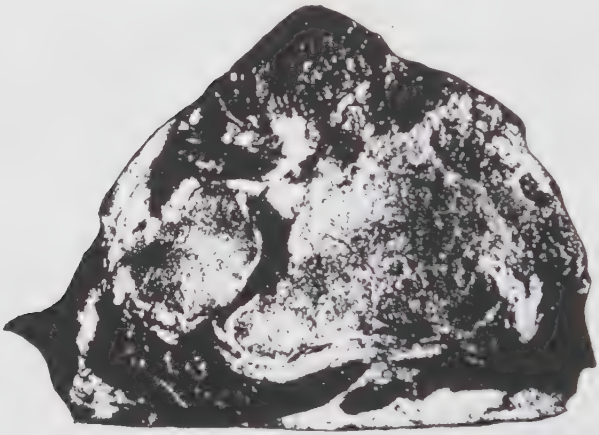
Sear the meat in a hot pan, then proceed as above. Instead of potatoes, dumplings may be added when the stew is tender. (For Dumplings, see page 348.)

Be careful to have enough liquid to prevent the dumplings from sticking. A little boiling water may be added before putting them in.

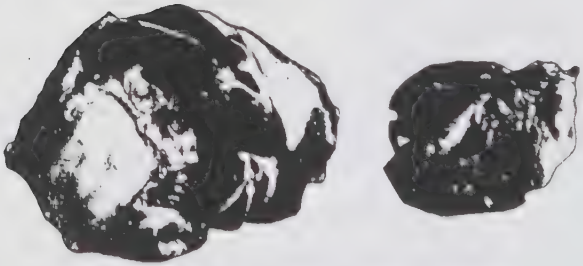
Pot Roast

(A thick pot is best for this.)

A cut from the round steak makes a good pot roast, or a piece from the chuck or shoulder may be used. Prepare as for roasting. Then sear in a hot frying pan, or in the pot, until it is partly browned. Add one-half cup of water to two pounds of meat. If a kettle with a large surface is used, more water will be needed. Lay a few slices of salt pork over



KNUCKLE SOUP BONE—ROUND
(Too much bone for best soup)



KNUCKLE SOUP BONES—FORE SHANK
(Less bone in proportion to meat)

FORE SHANK SOUP BONES
(A better proportion of meat to bone)

the meat. Cover tightly and cook very gently until tender, adding more water if the meat is in danger of sticking to the pot. When done season and add more water if needed; then thicken as for roast beef gravy. Onion, parsley, carrot, and bay leaf may be added for flavoring when the meat is put in the pot.

SOUPS AND BROTHS

For soup a cut rich in meat juices is desired; therefore a piece from the leg is usually chosen. The meat from the middle shin is the most desirable, as it contains a fair amount of flesh and will give a rich flavor; it has, too, a high proportion of bone which is rich in blood vessels, and in collagen and marrow. The very bony cuts give too much gelatin. A piece of lean meat must be added if bony cuts are used. Any cheap cut of meat may be used—shin, neck, joints, or tough ends of roast, steak, or stew. As the object in soup making is to extract as much juice as possible, the meat is cut into small cubes and the bone is sawed into inch lengths.

Meat soups are rich in extractives and stimulate the appetite if palatably seasoned, but they are not of much food value unless they are made very thick with some nourishing substance, such as rice, barley, or some of the pastes such as macaroni and noodles. If the meat is served in the soup, the food value is increased, as soup meat is nourishing.

***Brown Soup Stock (For Class of Twenty, 3 lbs. of Meat and Bone)**

(See Experiments I, II, and III)

(The making of stock and soup will require two lessons. All pupils should be taught both processes. Beginning pupils may omit lesson on clearing of soup stock.)

Proportions. Two parts of flesh to one part of bone, 1 qt. water to 1 lb. of flesh and bone.

Seasonings. For 1 qt. water. 1 tsp. salt, ¼ bay leaf, 1 pepper corn, 1 tbsp. chopped celery, 1 tbsp. shredded parsley.

For a family of six use 2 qts. water as it will be reduced in cooking and will give ¾ c. of soup for each serving.

This is not a rich stock, but makes a very palatable soup. A smaller amount of water will make a richer soup.

In making soup the bones from poultry, beef, and lamb may be used;

also any other cooked or raw meat, all browned skin, however, being removed. Do not use bits of highly seasoned meats or salt meats for soup. Mutton and the fat of lamb, for instance, impart a strong flavor. At least twice as much uncooked as cooked meat should be used. Soup stock can be kept for several days on ice, but spoils quickly if kept warm. If there is not time to cool the stock before using skim off as much fat as possible, then pass over it a piece of cloth first wrapped about a piece of ice, or remove the fat with absorbent paper. For a rich soup use twice the amount of meat given in the recipe above.

If there is no cooked meat to be added to the stock, one-third of the meat must be browned. Melt a little of the marrow fat in a small frying pan and broil the meat in it. Put all the meat and bone in a deep enameled soup kettle with a close fitting lid, pour the water over it, add salt, and let stand for one hour. Why let stand? (See Experiment II.) Cook very gently for five or six hours. One hour before the soup is done add the vegetables and pepper corns (the flavor of vegetables is driven off by long cooking). When the vegetables are soft, strain the stock through a sieve into a porcelain bowl. Cool quickly and keep in a cool place until ready to use. Then remove the fat (see Fats and Oils). The layer of fat keeps the air from the stock and helps to preserve it.

Clearing Soup Stock (Class Recipe ¼)

Allow one egg to each quart of stock. After removing the fat put the stock into a saucepan. Add the egg slightly beaten. Place the saucepan over a brisk heat, and stir constantly. When the stock is warm add any seasonings needed and continue stirring until it boils. Boil for two minutes, then lower the heat and let simmer for twenty minutes. Skim and strain through a double thickness of cheesecloth, wrung out of hot water.

By boiling, the albumin of the stock is coagulated, and the egg as it is heated also coagulates and entangles all solids in the stock in it. Clear soup is less nourishing than other soup, but as it is usually served at the beginning of a heavy dinner this is not objectionable.

Bouillon

This is a rich soup stock made of lean meat without bone. Use 2½ lbs. of meat to each qt. of water. Season as directed for brown stock, adding 2 tbsp. each of chopped carrot and turnip, and 1 tbsp. of onion. Clear if desired. Reheat and season to taste with salt and pepper and serve in cups.

White Stock

Veal or chicken is used for white stock. 2 lbs. of knuckle of veal to 1 qt. of water should be used. Proceed as for brown stock, but do not scar the meat. Omit parsley and add a blade of mace, and ½ tbsp. of onion.

***Vegetable Soup (Class Recipe ¼)**

1 qt. uncleared stock	½ pt. tomatoes
3 tbsp. carrot or	3 tbsp. celery
3 tbsp. green peas or asparagus tips	½ tbsp. onion

The vegetables should be cut into thin strips and cooked gently in the soup until tender.

***Tomato Soup**

1 qt. stock	1 qt. fresh or canned tomato
2 tbsp. chopped onion	2 tbsp. chopped carrot
1 tbsp. parsley	4 whole cloves
¼ tsp. fresh or powdered thyme	1 tsp. cornstarch soda
2 tbsp. cold water	

Cook tomatoes, soup stock, and seasonings together for half an hour. Strain. Bring to the boiling point. Add cornstarch mixed to a paste with cold water. Let simmer for fifteen minutes. Skim and serve in hot cups with one teaspoonful of whipped cream on each cup. Pass croutons or small thin crackers with the soup.

LEFT-OVER MEATS

Since meat is such an expensive part of our diet none of it should be wasted. As it is perishable it should not be cooked in large quantities, but any that remains may be served in many palatable forms.

Fat from soup, gravy, etc., may be clarified and used for many purposes (See page 225). Uncooked fat may be rendered (See page 225) and used.

Broiled meats are not easily utilized but may be stewed very gently until tender, then used in various ways.

Roast beef is not economical for a small family unless all the cold meat can be made into appetizing dishes. Beef reheated by the following method can hardly be distinguished from that cut from the fresh hot roast.

***Reheated Beef**

Slice the beef thinly, warm a platter of suitable size, make a rich brown gravy, and lay the meat on the platter. Pour over it the hot gravy, place it in the warming oven for ten minutes (the oven must not be too warm), and serve. Meats reheated in this way may be utilized in a hot sandwich.

Gravy. Left-over gravy may be reheated or a good heavy gravy may be made of rich beef stock thickened with browned flour. The gravy should be seasoned to taste. The bones of the roast will make a good stock for the gravy.

Another method of reheating is to cut the meat into thin slices, then broil quickly in a boiler, or pan broil. The meat must not be very brown—just heated. Pour over it a little melted butter, or brown or tomato sauce.

The bits of meat that are too small to reheat in the manner given above may be utilized in hash, served on rounds of toast, or in a rice border. Remember that meat that has been cooked is toughened by additional heat, so must be heated very moderately the second time and for a short time only.

Meat Cakes

Any cold meat may be mixed with bread crumbs and a little egg, or with mashed potatoes, or cooked rice, and molded into cakes, then dipped in egg and crumbs (see page 122), and browned in a quick oven. Serve with brown gravy, or with white or tomato sauce. Rice combined with chicken or mutton and served with white sauce is appetizing; with beef, potatoes and brown gravy are good.

Jellied Meats

Cold meats molded in jelly (See Turkey in Aspic, page 185) serve as a pleasing variation from hash and croquettes. A little soup stock, well flavored, with gelatin added may be used. Serve jellied meats on lettuce leaves with an appetizing dressing unless they are highly seasoned.

English Hash

1 c. chopped meat	½ c. gravy
1 tsp. chopped onion	salt, pepper, and flour

Meat reheated in gravy is more digestible than browned hash. Chop the meat. Sprinkle with flour, pepper, and salt. Heat the gravy and onion. Add the meat and let barely simmer for ten minutes. The hash may be served on toast, thus utilizing stale bread.

*Casserole of Rice and Meat (Class Recipe)

Soup meat may be utilized in this dish, as it is nourishing. Since it has lost the extractives which give flavor, additional seasoning is required.

Line a buttered custard cup with rice. Chop the meat, sprinkle with salt and flour, and add a drop of onion juice. Pack the mixture in the center

of the cup. Pour over it a tablespoonful of the stock and cover with rice or crumbs, then steam for twenty minutes. Let stand for a few minutes. Turn from the cup and serve. Tomato sauce may be used with the casserole. (For Tomato Sauce, see page 126.)

For home use an earthenware pudding dish may be used for the casserole and it may be served directly from the dish.

Cold chicken may be served in this way with a white sauce.

QUESTIONS AND PROBLEMS

Why is meat cooked? Why does a rapid heating of the surface of meat keep in the meat juice? Mention several ways in which this heat may be applied. Why is flour, egg, or batter put on meat? What is the main point to keep in mind in making soup? Why is undercooked meat objectionable? What is the result if it is overcooked?

Tell how to prepare meat for cooking. What is meant by broiling? What meats may be broiled? Describe a properly broiled steak. Write a menu for luncheon or dinner with broiled steak for the meat. What dessert is appropriate? Which do you prefer, pan broiling or frying? Why? What cuts are suitable for roasting? Describe the process. What cuts are suitable for stewing (see Table)? Write a recipe for meat pie using the stew and chicken pie recipes for examples. Compare actual time used in preparing stew and broiled steak. Compare the cost of each. Compare the palatability of each. Why does veal require thorough cooking? What cut of veal would you select for soup? What is the proper proportion of meat and bone in veal for soup? What meats could be used for soup? Compare the food values of bouillon and a soup where the vegetables and meat are served in it. Why is soup boiled to clear it? Why is egg added?

What use can you make of the fat from the top of the soup? Of that from stews and roasts? How can you render suet? How would you utilize cold stew? Soup meat and roast?

Supplementary Recipes

*Pork sausage (p. 371)
Liver and bacon (p. 371)
Broiled ham (p. 371)
Roast leg of lamb (p. 370)
*Breaded mutton chops (p. 370)
Roast pork (p. 370)
Ham, boiled and baked (p. 372)
Hocks and other bones (p. 372)
Veal pie (p. 369)
*Beef balls in fireless cooker (p. 369)
Braised beef (p. 368)
*Veal loaf (p. 369)
Browned hash (p. 368)

CHAPTER XII

POULTRY AND FISH

POULTRY

The housekeeper who understands the raising and use of poultry can do much to lessen the cost of the important protein foods. Refer to table for composition of young and mature fowls.

Selecting Live Poultry. When possible, chickens or other poultry should be purchased alive as the presence of disease is then more easily detected. Healthy chickens should have bright eyes; a drooping bird is sick. The legs should be smooth. A young chicken or other fowl has soft feet and a smooth skin; the cartilage at the end of the breast bone is soft, and pin feathers are abundant. Very long hairs denote age. If grown fowls are old the breast cartilage is stiff. A fowl should be fat and plump; young chickens are not as plump as older ones. The bird should be heavy in proportion to its size. Examine carefully, especially under wings and legs, and on neck and head, for lice, fleas, and ticks. A bird so infested cannot be in good condition. In most markets birds of light or yellow skins are in demand. Grown chickens are known as fowls and young ones as spring chickens. The smaller of these are called broilers, the larger, fryers.

If one has a place for keeping chickens it is well to purchase them by the dozen, thus reducing cost. Careful feeding for a week or two will improve the flavor of the meat. A ration of corn, wheat bran, and skimmed milk, with some green vegetable that is not too highly flavored, produces a plump, tender bird of good flavor. Table scraps are a good supplement to such a ration.

Dressed Poultry. Poultry should be drawn as soon as killed, as the digestive organs are filled with substances that

decompose rapidly. The liquids pass readily through the walls of the intestines, and are absorbed by the tender flesh.

A good fresh fowl should have a well-rounded, plump form with no bony angles about the breast. These always indicate a lack of tender white meat. The skin should be free from bruises, blotches, and pin feathers. If the bird is scalded before picking, the skin may look drawn. The flesh should not be flabby, but should yield evenly and gently when pressed with the fingers. If the chicken is fresh, the feet are moist and limber, and the eyes appear bright and full.

Poultry does not keep as well in cold storage as beef does; the young chickens especially decompose very quickly. Cold storage chickens have a peculiar squeezed appearance, due to the way in which they have been packed. They also have a distinctive odor that is not found about the fresh birds.

Fowls carefully dressed and promptly cooled may be kept in a clean refrigerator for a week if the temperature does not go above 50° F. In most households, however, the temperature of the ice-box is not uniformly as low as this. If dressed birds are to be kept longer, the atmosphere should be dry and the temperature not above 34° F.

Dressing Fowls. No food should be given to fowls for at least twelve hours before they are killed. This makes the removal of the intestines much easier. The usual manner of killing is by cutting off the head. The bird is then hung head down for several minutes. It should be picked before the feathers become set. Dry picking is considered the best for market fowls, but for home use scalding before picking is to be preferred. Insects on the bird will be killed in this manner. Never use water that is quite boiling for young chickens, as boiling water softens the skin so that it is apt to be torn when the feathers are pulled out.

Put the chicken in a deep pan. Have a kettle of boiling water ready. Pour a cup of cold water in the kettle. Then pour the water over the chicken. Turn the chicken from side to side, holding it by one foot; then with a cloth and fork lift

it by the neck and turn the feet down into the water. Hold it up to drain. Then lay it in a pan and pick off the feathers. Remove pin feathers with the point of a knife, being careful not to break the skin. When all the feathers are off, the fowl should be singed to remove the hairs that are to be found even on young birds. Hold the chicken over a gas or alcohol flame, turning it about so that the flame will reach every part, but do not let the skin and flesh become too hot, as they will then become scorched and will have a bad taste. If there is no gas flame singe the bird by holding it over burning paper. As soon as the chicken is singed cut off the legs at the knee joint. Lay the chicken in a pan of cold water and scrub well with a clean cloth, then dry and lay on a meat board.

Cutting Up and Dressing a Chicken for Panning or Frying. With a sharp knife cut off the oil bag that lies at the top of the tail. Take out the crop, first cutting through the skin about the middle of the crop, then pulling out the pouch. Cut the neck bone off close to the shoulders. After this is done cut off the wings and legs close to the body and turn the tips of the wings under the first joint. Divide the legs at the joint between the second joint and the drum stick. Put the knife in at the point of the wish-bone which lies over the breast. Then slice up toward the neck where the points of the wish-bone are joined to the shoulders. Cut down at each side of the neck and take off the bones which look like the wish-bone, but which lie in a reverse position. Lay the chicken on the meat board with the underside up. Cut across the skin a little way from the tail, making a horizontal cut. Be careful not to make the cut deep enough to enter the intestines. Lift, and turn the breast-bone back until the intestines are visible. Lift the heart, gizzard, and intestines, being careful not to break anything, and cut around the tube that joins the intestines to the skin. Separate the back from the breast and neck. Divide in two parts, cutting along the side of the back-bone. Separate the breast from the neck and cut into two pieces lengthwise. The neck may be used for stock or gravy. Remove the gizzard, liver, and heart from the intes-

tines, being careful not to break the gall bladder, which is a greenish gland lying under the left lobe of the liver. Remove the gall bladder, taking a part of the liver with it. The liver should be smooth and of a solid brown color. If mottled or very much enlarged it should be discarded; if it shows abscesses or parasites throw the bird away. Make a cut around the gizzard, being careful not to cut the inner lining, pull the gizzard open, and turn out the inner sack. Cut off the tubes of the heart.

FOWL TRUSSED FOR ROASTING (Left)
CHICKEN CUT FOR PANNING (Center)
CHICKEN SPLIT FOR BROILING (Right)

Wash the giblets (the heart, liver, and gizzard) very thoroughly. Remove the lungs from the cavities formed by the ribs and take out the kidneys, which are found in the back. Throw away kidneys and lungs. Wipe the chicken with a damp cloth. Keep in a very cold place for twenty-four hours, or cook immediately. The flesh of animals becomes stiff soon after killing and does not soften for several hours.

Dressing a Fowl for Roasting. Make a slit in the skin at the side of the neck and remove the crop and wind pipe, cutting

off the tube that goes from the crop to the gizzard. Make a vertical cut in the skin from the tip of the breast bone to the under part of the tail. Insert the hand as high up as possible and remove the heart, liver, and intestines, cutting carefully around the part of the intestines that joins the skin. Remove the lungs and kidneys. Pour water through the fowl until the cavity is well washed. Wipe inside and out very carefully, then truss into shape.

Trussing a Fowl. When a bird is to be cooked whole, it should be trussed into shape as soon as it is cleaned. For trussing, use metal skewers or a mattress needle and twine. Press the legs closely against the body, pass the needle through the second joint (from the right), bring out on the left side, pass the needle back near to first stitch, and tie. Put a like stitch through the wings. Draw the drumsticks together and tie, bringing the ends of the joints close to the tail and passing the string around it. Turn the neck skin to the back between the wings and fasten with a stitch. Skewers may be used in this manner. When ready to stuff remove the skewers, if necessary.

METHODS OF COOKING CHICKEN

Spring chickens are more palatable when cooked by some of the quick methods and with little water. The large fryers make good stews, but the juices of the young, tender birds will not bear so much dilution. The flesh of young chicken is easily digested if properly cooked; that is, by a simple method without high seasoning. Frying is most objectionable, as chicken cooked in this way taxes any but the strongest digestion. Older fowls may be roasted or fricasseed. Very old fowls are seldom palatable. They must be stewed, braised, or boiled.

*Roast Chicken

(See Roast Turkey, page 184.)

Select a chicken not over a year old. Dress and truss as directed. If the chicken is to be cooked unstuffed, split it down the back when drawing it, and after wiping it fasten the legs and wings in position.

Sprinkle the chicken with salt, dredge with flour, and place it in a baking pan, flesh side up. Lay over the legs thin slices of salt pork and put a few small pieces in the pan. Cook in a hot oven, basting frequently. When the flesh side is well seared, cook for a short time with the skin side up in order to brown it. Cook fifteen minutes to the pound.

Do not fill the cavity entirely when stuffing. (See Bread Stuffing, page 185.) While cooking turn the fowl frequently as the breast will be more tender than if kept up all the time. Serve with giblet sauce.

*Giblet Sauce

GIBLET STOCK { Feet with skin removed 1½ c. cold water
Piece of neck
Tips of wings
Heart, liver, and gizzard
Cook as directed for soup stock (p. 173) until flesh is tender.

1 c. of giblet stock 2 tbsp. butter or chicken fat
1½ tbsp. browned flour or 1 tbsp. white flour

Proceed as for brown sauce, add chopped giblets, and serve in a gravy boat.

Panned Chicken

Select a medium-sized spring chicken. Dress and cut in pieces as directed. Wash and, while still moist, sprinkle with salt and a very little pepper. Roll in flour. Place in a shallow baking pan, just large enough to hold the chicken. Put directly over the flame and pour in two cups of boiling water. When the water is boiling briskly, lay the chicken in. Add two slices of salt pork and let boil for three minutes. Then put the pan under the flame of a gas stove or on the grate of a wood stove. When the surface of the chicken is crusted over and slightly browned, cover and cook until tender. When done arrange the chicken on a hot platter, and place the pan over the flame. Dilute the gravy with a little hot water if necessary. Add one-fourth cup of thin or two tablespoonfuls of thick cream. Bring to the boiling point and season to taste. Pour it over the chicken. The gravy should be moderately thick and if necessary flour may be added when the cream is put in.

Stewed Chicken

Cut a chicken as for panning. Sprinkle with salt and flour. Drop into barely enough boiling water to cover, and boil for five minutes. Then cook gently until tender. Season to taste. Thicken the gravy if necessary. Serve hot. The time needed depends on the age of the chicken.

Chicken Fricassee

Dredge chicken with flour, brown in bacon fat, and then proceed as for stewed chicken. Thicken the gravy by adding the yolk of one egg to each cup of liquid.

Chicken Stock

2 qts. cold water — One medium-sized fowl

Cut up the fowl as for panning. Reserve the giblets, as they give a strong flavor to the soup. Proceed as for white soup stock (See page 174), omitting the mace and adding one tablespoonful of carrot. Strain and cool.

Chicken Soup

Remove the fat from the stock. Add one cup of thin cream for each quart of stock. Heat to the boiling point. Season and serve.

METHODS OF COOKING TURKEY

Turkeys have considerable fat in the fibers and therefore are not adapted to use in hot weather. The half-grown turkeys are delicious if split down the back and quickly roasted. Older birds may be stuffed and cooked. A young turkey hen, if plump, is more economical for a small family than a large gobbler, but the latter furnishes a greater proportion of breast.

Turkey is dressed as other poultry, for roasting. If one is skillful the tendons may be removed before the legs are taken off. Cut the skin around the leg one and a half inches below the knee joint. Bend the leg over the edge of the table just at the cut and break the bone. Pull off the foot, bringing the tendons with it. If the bird is old, use a steel skewer, removing each tendon separately.

When are turkeys plentiful in your markets? What is the cost per pound? How does this compare with the price of beef? In selecting turkey, how would you judge the age?

Roast Turkey

(See Dressing a Fowl for Roasting, page 181.)

After the turkey is cleaned and trussed, put it in a cool place over night, or keep on ice for several days if desired. Any preferred stuffing may be used. Never use oyster stuffing unless the bird is to be eaten immediately after cooking.

When the stuffing is ready, fill the neck cavity (using a spoon) until the breast looks plump; then turn the skin to the back and sew it down. Fill the body cavity well but do not pack. Sew up the opening, using a large needle and a coarse thread. Take a few stitches but do not draw them very tight. Skewer or sew the legs in place. Dampen the outside of the fowl, sprinkle with salt, dredge thoroughly with flour, lay on a rack in a baking pan with the breast up, place in a hot oven, and baste every ten minutes with equal parts of hot water and melted butter. At the end of the first half hour, add one-half cup of water and use the liquid in the pan for basting. Have the oven very hot for the first half-hour and then lower the heat slightly. Cook an eight-pound fowl for two and one-half or three hours. Keep the breast down part of the time, and it will be more juicy. When ready to serve, garnish with curled celery tips or parsley and serve with it giblet sauce (See page 183) and a tart jelly.

*Plain Bread Stuffing

1 qt. bread
1 tbsp. chopped parsley
½ tsp. white pepper
1 tsp. salt

Cut slices one-half inch thick from stale bread. Remove the crust, butter carefully, cut into small squares, and sprinkle with salt and pepper. Add parsley. If desired add to the dressing two tablespoonfuls of finely chopped onion, or one cup of chopped celery.

Turkey in Aspic

Left-over turkey may be utilized in the same way as cold beef or chicken.

1¼ qts. stock
2 tbsp. chopped carrot
1 tbsp. parsley
1 tsp. savory
2 cloves
2½ tbsp. gelatin
salt
2 egg-whites
2 tbsp. chopped onion
2 tbsp. chopped celery
1 tsp. thyme
1 bay leaf
½ tsp. peppercorns
2 tbsp. lemon juice
cayenne

Cook the turkey bones for three hours in a covered saucepan with one and one-half quarts of water. Cook until reduced to one and one-fourth quarts. Add seasonings, except lemon juice, cayenne, and salt. Cook for ten minutes. Strain through cheesecloth, and cool. Soak the gelatin in one-half cup of the cool stock until soft. Warm the remaining stock. Then add the gelatin and lemon juice and bring to the boiling point. Season with salt and cayenne. Beat the whites of eggs until slightly foamy. Add to them

gradually one cup of the hot mixture. Then add the egg and stock very gradually to the hot liquid, and bring again to the boiling point, stirring constantly. Remove to the back of the range and let stand for half an hour. Strain through a jelly bag and cool. Select a round pan that will be full when the turkey and jelly are added. Set the pan in ice water and pour in enough of the aspic to cover the bottom. When this is firm, decorate the surface with hard cooked eggs sliced and cut in fancy shapes. Pour in more aspic, a spoonful at a time, until the eggs are firmly fixed, and then add enough to make the jelly three-fourths of an inch thick. When firm, put in a layer of turkey in small, thin slices, first dipping them in a little liquid aspic. Add the jelly a little at a time until the mold is full. If the mold is very deep, two layers of turkey may be added. When the jelly is firm, turn from the mold on to a fancy platter and garnish with parsley, or cut in slices and serve on lettuce leaves.

Minced Turkey on Toast

Remove the meat from the bones. Break the bones and remove all scorched portions; then cover with cold water and bring to the boiling point. Let simmer for one hour. Strain the liquid and remove the fat from the top. Cut the meat in small cubes, removing all scraps of skin and dressing. Sprinkle lightly with flour, turn into a saucepan, and cover with the stock made from the bones. Have the stock boiling and add only enough to cover the meat. Let simmer gently for twenty minutes; then add one tablespoonful of flour and two tablespoonfuls of rich cream. If thin cream is used, add one teaspoonful of butter. Heap on nicely browned squares of toast and serve on a large platter.

COOKING OTHER FOWL

The Guinea Fowl. In some markets, the guinea fowl is cheaper than other poultry. A guinea fowl over a year old is not palatable, but the young birds when just feathered are delicious if broiled. Roast as directed for chicken, unstuffed.

Ducks and Geese. Domesticated ducks should be young to be at their best. Some of the improved breeds now on the market make plump fowl at an early age. Fully matured ducks are too oily to be very palatable and are apt to disturb the digestion. Geese are good only when young. Dress as directed for chickens. Ducks and geese have no crop. Stuffing

is used in duck only to give flavor. Put into the body cavity a peeled onion, one or two apples cored, peeled, and quartered, and a little powdered sage. Salt, dredge with flour, and cook as directed for roast chicken.

Squabs. Young pigeons, known as squabs, should be fat and plump. The large ones, known as jumbo squabs, are now much used as game. They are usually broiled, but may also be stuffed with sweet potato and roasted as directed for chicken.

QUESTIONS AND PROBLEMS

Would it pay you to raise poultry? How does the flesh of chicken compare with that of beef in digestibility and food value? What is the percentage of waste in live fowls? In dressed fowls? How much per pound does the part that is served cost? How much of this is waste? Compare cost of beef, mutton, and chicken.

Describe the appearance of a chicken in good condition. How can an old fowl be distinguished from a young one? What objection is there to cold storage chickens?

What method of cooking should be selected for spring chicken? Mention a way of cooking a "frying" chicken that would enable one to serve the largest number of persons. How could cold chicken or turkey be used? What precaution must one use in cooking left-over meat dishes?

What poultry and game are available in your locality? Is it fresh or from cold storage? How does the price compare with other meats? What points should be considered in judging the quality and condition of meats? What one meat may be had in the best condition in your market? Can you make this one your staple meat, considering carefully price and palatability?

FISH

Fish is perhaps a little more difficult to digest than tender cuts of beef or tender chicken. The varieties that contain much fat are more difficult to digest than the leaner kinds. Red snapper or bass is more digestible than Spanish mackerel. Why?

In markets remote from the water there are few varieties of fish offered, but near the great bodies of water there are many kinds from which choice may be made, including pompano, sea trout, Spanish mackerel, red fish, red snapper, flounder, cod,

haddock, halibut, salmon, and shad. Among the fresh water fish are perch, trout, bass, and catfish. Of the shellfish oysters, clams, shrimps, lobsters, and crabs are used.

Compare food value of fish as given in the table, page 147, with that of beef. Compare prices in your market. For a given sum—twenty-five cents, for example—which would furnish the greater quantity of food, beef or fish, not considering food value? Compare, considering food value and price. What fish are offered in your market? Where are they caught?

Selecting Fish. Any variety of fish that has been out of water long is not a safe food. In selecting fish, always choose the freshest. Fish from clear cold water are more highly esteemed than those from warm water; and those from gravelly or sandy bottoms are considered better than those from muddy bottoms. Fish allowed to die slowly spoil more rapidly than those killed immediately. Fish for transportation should be frozen.

Good fish must be firm; if the tail is limp the fish is old. The following advice, from the United States bulletin on fish, furnishes a safeguard against the purchase of stale fish. "Fish should be considered unfit for food when their eyes have lost their sheen, the cornea is somewhat cloudy, the gills pale red, and the blubber shows at the gills; when the scales are dry and easily loosened, or when the meat is so soft that when pressed with the fingers the indentation remains." Some unscrupulous dealers use blood coloring on the gills; others remove the head. Any fish with a strong odor should be avoided. Fish is a frequent source of ptomaine poisoning, and it is not safe to use any but the freshest.

Oysters are not in the best condition in summer. If dead in the shell they are not fit for food. Good oysters close the shell when removed from the water, and move when touched. There is a clean fluid inside the shell. The slightest odor of staleness about the oyster is a good reason for rejecting it. No preservatives should be used. Oysters should not be frozen. The oyster, if from polluted waters, may be a source of typhoid and other diseases.

Canned and Preserved Fish. Fish decomposes easily, and if canned has the additional danger of a possible absorption of metal from the can. Like all preserved meats, it is more difficult to digest than the fresh fish. Fresh foods can usually be substituted for it. What foods other than meat are a good substitute for fish in your locality?

Cleaning Fish. Fish is usually cleaned at the market, but as the cleaning is often carelessly done, one should remove the remaining scales when it is received. Begin near the tail and work toward the head. Use a knife, turning it a little toward your body, so that the flesh will not be cut. A large number of scales are found on the flank and under part of the body. After the scales are removed, cut off the head, if desired, and wipe the fish inside and out with a cloth wrung from cold water. The fins may be cut off close to the body with large scissors. When fish are to be split and boiled or baked, always remove the back fin. If the fish has not been dressed, remove the scales as directed. Then split the fish on the lower part of the body and remove the intestines.

Fish is sometimes skinned, but this can be done successfully only when the fish is fresh. To skin a fish remove the back fin, cutting off a narrow strip of skin with it. Loosen the skin next to the gill on one side; then pull the skin from the flesh. Remove the skin from the other side in like manner. After the fish is skinned it may be boned. Beginning at the tail, run a sharp knife along the back, making as clean a cut as possible. Lift off the half of the fish, then turn and remove the other side. Pick out the small bones with the finger. A piece of skinned and boned fish is known as a fillet.

Opening Oysters. To open oysters use a stout thin knife. Put the knife under the back of the upper valve and press it to the front until it cuts the muscle that joins the shells, then lift the upper valve.

Cleaning Oysters. Oysters are usually delivered with the shells removed. Pick the bits of shell off and place the oysters

in a sieve. Wash by pouring over them a little cold water, a half cup to a pint of oysters.

Ways of Cooking Fish. The principles of cooking given for meat apply in a general way to fish. The following are some of the exceptions: since fish is more watery, the flesh requires a high temperature throughout the cooking period. Fish should never be served rare. It must be thoroughly cooked but not overdone. Fish is done when it shrinks from the bone and when no juice flows as the flakes are pulled apart. Oysters should be lightly cooked as they become tough if overheated. Oyster stew must not boil.

The method of cooking depends on the quality of the fish and on the size. Thin, highly flavored fish like pompano, Spanish mackerel, and trout, are best when broiled, and should be served with plain dressing so as to preserve the flavor. Sliced fish may also be broiled. Fish that require liberal seasoning, such as the red fish, are best when baked or pan broiled in the oven. It is difficult to baste a fish satisfactorily while broiling it. Large fish, rich in fat, may be boiled in salted water to which lemon juice has been added. The salt adds to the flavor and the lemon whitens the flesh. Fish lacking in fat must be cooked with fat or served with a rich sauce. An acid sauce or relish is appetizing. Small bony fish are fried.

Removing Fish from Broiler. Fish sticks to the broiler and is difficult to remove. When the fish is done, place the broiler over a large pan or on a zinc covered table. Take a four-pronged kitchen fork and slip it over the wire of the broiler so that two prongs are on each side of the wire. Press down on the fish and slip the fork the full length of the wire. Repeat on all the wires, touching the fish on both sides of the broiler Then slip the fish from the broiler, skin side down, to a warm platter.

Baked fish may be easily removed from the pan if strips of cloth dipped in bacon fat are placed under it when it is put into the pan.

***Fish Broiled Under the Gas Flame (Class Recipe—One small fish for four pupils)**

Fish may be pan broiled very well under a gas flame or on the grate of a wood range. Heat an ordinary baking pan very hot and rub with melted butter. Split the fish and remove the back-bone. Place it in the pan on a slice of fat pork with the skin side down. Draw the fish together to protect the thin middle portion. Sprinkle with salt and pepper and baste well with melted butter. Cook for at least half an hour. Have the gas flame turned high until the fish browns; then lower the heat. Place on the lower shelf of the upper oven occasionally to heat the bottom. Baste with lemon sauce every ten minutes. Lift the fish carefully on to a large platter and garnish with parsley and slices of lemon.

Lemon Sauce

1½ tbsp. lemon juice	2 tbsp. butter
4 tbsp. hot water	

Mix all together, and place on the back of the range to keep hot.

***Baked Fish, Hollandaise Sauce**

A 3 or 4 pound fish	1 c. bread crumbs
1 tbsp. capers	1 tbsp. chopped parsley
1 tbsp. chopped onion	1 tbsp. melted butter
¼ tsp. white pepper	½ tsp. salt

Select a fish suitable for baking and clean as directed. Use but little stuffing as it is only for seasoning. Mix the stuffing. Fill the cavity and sew up the opening. Rub the fish thoroughly with salt. Put pepper and butter on both sides. Cut gashes across sides of fish two inches apart. Do not have the gashes opposite one another. Lay a very small strip of salt pork in each gash. (If pork is not used, baste with sauce given for broiled fish.) Skewer fish in shape of letter "S" and dredge well with flour. Put pieces of pork in pan so that the fish will not stick. Place the fish on a strip of cheesecloth and bake in a hot oven, allowing fifteen minutes to the pound. Baste frequently; garnish with parsley and slices of lemon, and serve with Hollandaise Sauce. (See page 192.) Fish with dry flesh is improved if baked in a covered roasting pan.

Boiled Fish

Select a whole fish of three or four pounds or a thick piece of like weight from a large fish if a small one is not obtainable. Be sure that the piece selected is very compact.

A fish kettle with a rack is desirable, but if none is at hand a perforated frying basket may be used or a perforated tin sheet may be supported in a saucepan. When a piece of fish is used tie it in a freshly scalded cheesecloth to prevent the scum from settling on it. The size of the kettle must be adapted to the fish so that a large quantity of water need not be used. Barely cover the fish with boiling water. Add one teaspoonful of salt, and one and one-half tablespoonfuls of lemon juice. Place on the fire and boil gently until the flesh is ready to leave the bone—about half an hour will be required, the time depending largely upon the amount of surface exposed to the water. Lift the sheet very carefully from the kettle and slide the fish on to a hot platter, first removing the cheesecloth if one has been used. Garnish with parsley and potato balls. (Cut small balls from white potatoes with a vegetable scoop, and cook in boiling salted water.) Put a little sauce over the center of the fish and also a few slices of hard cooked egg. Serve with egg or Hollandaise Sauce and vegetable jelly or cole slaw.

Hollandaise Sauce (⅓ Recipe for 4 Pupils)

½ c. butter	2 egg yolks
⅓ c. boiling water	1 tbsp. lemon juice
¼ tsp. salt	

Put the butter into a bowl, cover with cold water, and wash, using a spoon. Divide the butter into three pieces. Put one piece with egg yolks and lemon juice into a saucepan and cook over hot water. The water must not boil. Stir until the butter melts. Add second piece, then third. When melted add water and cook for one minute. Season, strain, and serve.

Codfish Balls With Tomato Sauce

4 medium-sized potatoes	¼ c. milk or cream
¼ tsp. white pepper	½ lb. dried codfish

Pull the codfish apart, pour boiling water over it, let stand a moment, and heat to boiling point. Drain. Cover with cold water and proceed as before. Do this a third time. Then press very dry and add potatoes (which have been boiled and mashed), the white pepper, milk or cream (if milk is used add one tablespoonful of butter), and salt if needed. Rub until smooth then form into balls. Lay on a buttered pan, and set in a hot oven for fifteen minutes. Place the balls on a hot platter and pour over them a tomato sauce. (See page 126.)

Canned Salmon

Canned fish should be used sparingly. Turn the fish from the can into a porcelain bowl as soon as opened; air for at least one hour, then reheat in a steamer.

***Salmon Loaf**

1 or 2 c. salmon	2 eggs
1 c. stale bread crumbs	½ c. milk
1 tsp. shredded parsley	1 tsp. lemon juice
1 tsp. salt	½ tsp. white pepper

Remove skin and bones and mince the fish. Then add well beaten eggs, crumbs, milk, and seasonings. Mix well. Put into a greased mold and bake or steam for one hour. Serve hot with Hollandaise Sauce.

***Oyster Stew (Class Recipe ⅓)**

3 c. hot milk	1 c. oysters
2 tbsp. butter	salt and pepper

Heat the milk in a double boiler. Drain the liquid from the oysters and strain it through a double thickness of cheesecloth. Put the oysters in a small sieve and wash by pouring a half cup of water over them. Carefully slip each oyster through the fingers and remove all bits of shell. Heat the oysters in the strained liquid until the edges curl. Remove the scum and add the liquid and oysters to the hot milk. Then add the butter and seasoning. Serve immediately. Pass crackers that have been reheated to make them crisp.

Utilizing Left-over Fish. Fish can be kept only a short time, so it is well to cook it in quantities sufficient for one meal. If, however, any remains it may be used at the succeeding meal as creamed fish, fishballs, or croquettes. Croquettes may be browned in a very quick oven instead of being fried. For creamed fish, pick the fish into bits with a silver fork. Have a cup of moderately thick white sauce ready in a double boiler; add to it one cup of fish, and steam until thoroughly heated. Season and serve in a potato border.

For fishballs use two-thirds as much hot creamed potato, well seasoned, as fish. Form into balls, dip in fine white crumbs, then in egg, and again in crumbs. Lay on a buttered sheet and brown in a hot oven. Remove from the oven, brush the top with butter, and serve while hot.

QUESTIONS AND PROBLEMS

Where are the great fisheries of this country? How could the fish supply be protected and increased? Where is your fish supply obtained? Are the fish in your locality salt or fresh water fish? Make a list of the fish in your market, noting the points by which they may be recognized, and the price per pound. Which variety is of the best quality? How does it compare with beef in price and food value?

What points should be considered in selecting fish? How can one judge of the freshness of fish? What precautions should be observed in buying oysters?

Do you use canned fish? Give reasons for their use or avoidance. Is the canned fish cheaper than fresh fish or meat? Where is the canned fish that is used in this country prepared for market?

In what important points does fish cookery differ from that of meat cookery? What method of cooking should be used for a highly flavored fish? For a large solid fish? Which is easier, frying fish or broiling it under a gas flame? When is fish done? What sauce may be used with broiled fish?

Supplementary Recipes

Panned Broiled Chicken (p. 358)
Broiled Chicken (p. 358)
Chicken Pie (p. 358)
Maryland Chicken (p. 359)
Chicken with Rice (p. 359)
Oyster Stuffing (p. 378)
Chestnut Stuffing (p. 378)
Broiled Pompano (p. 365)
Fried Fish (p. 365)
Broiled Salt Mackerel (p. 365)
*Scalloped Oysters (p. 373)
Salmon Salad (p. 365)
Broiled Oysters (p. 372)
Oyster Cocktail (p. 373)

CHAPTER XIII

BREADS AND LEAVENING AGENTS

Bread has been called the staff of life because it is eaten at almost every meal. Good bread is a very valuable part of the diet. The principal grains used for bread in this country are wheat, corn, and some rye. When made of these grains bread contains some of all the food elements, but as it is particularly rich in starch it is eaten with fat in the form of butter, gravy, or milk. Since it does not contain all the tissue building foods needed, meat, eggs, or cheese are also used with it. More nutriment is obtained for a given sum in good bread than in any other food.

Bread was one of the first cooked foods eaten by man. The savage soon learned to parch grain for food and a little later ground it and mixed it with water, then baked it on a hot stone or before the fire. The tortilla of the Mexicans is made in this way; the hoe cake of the South is another of these simple breads. In Puritan days the journey-cake, as it was called, was made in this manner and was carried by the pioneers on their expeditions. The term Johnny-cake is a corruption of journey-cake.

Bread may be divided into two great classes—leavened and unleavened bread. The word leavened means lightened.

Why Bread Is Leavened. Bread is lightened to make it porous so that it will be more thoroughly baked, and so that the digestive juices may reach it. A dense, heavy bread gets very hard and dry while being thoroughly cooked and is not palatable. It is leavened or lightened by a gas (carbon dioxide, produced by the growth of the yeast plant), which is formed by baking powder, or by soda and some acid, and by air incorporated by beating, or by steam.

BAKING POWDER AND OTHER LEAVENING AGENTS

EXPERIMENT I. Stir one-fourth teaspoonful of a cream of tartar baking powder into one-fourth glass of cold water. Note the fine bubbles that result. These are gas bubbles formed by substances in the baking powder that unite when they are moistened and give off a gas.

EXPERIMENT II. Repeat Experiment I, using hot water. In which glass did the bubbles form more quickly? The ingredients of the baking powder do not dissolve as quickly in cold water as in warm. This is a great help in mixing baking powder breads as the gas is not all formed before the bread is put into the oven.

EXPERIMENT III. Put a tablespoonful of vinegar into a glass and add one-fourth teaspoonful of soda. What happens?

EXPERIMENT IV. To one-half cup of thick sour milk add one-fourth teaspoonful of soda. Stir well and note the result.

In all of the experiments a gas was formed. In Experiment III, where vinegar and soda were used, the gas passed off so rapidly that it could not be conveniently used in making bread. What two substances were found in each experiment?

Baking powder is made of soda, cream of tartar, and cornstarch. The cornstarch has nothing to do with the forming of gas, as could be proved by mixing cornstarch and soda and wetting it. The cornstarch is added to keep the soda and cream of tartar from uniting before it is to be used. Cream of tartar is an acid obtained from the crystals formed on the sides of wine casks, and has a sour taste. (From what is wine made?) The milk used in the experiment was sour and so was the vinegar. In each mixture we had soda, which is a mineral obtained usually from common salt. The soda gives off carbon dioxide when moistened and heated, or when mixed with an acid. An acid is used with it to destroy the taste. From this it is concluded that when soda and an acid are mixed and moistened a gas is produced. This gas is known as carbonic acid gas or carbon dioxide. What has been learned about this gas in the physiology lesson? When the gas is formed in bread it attempts to escape and in doing so it lifts the dough and lightens it.

EXPERIMENT V. Add one-fourth teaspoonful of soda to one tablespoonful of sour milk in a test tube. Stir, and as it effervesces bring the mouth of a test tube containing the lime-water near the first tube. What is the result?

EXPERIMENT VI. Heat the mixture in Experiment I in a test tube or small saucepan. When it effervesces briskly, hold a lighted match close over it. What is the result?

Carbon dioxide turns lime-water milky and extinguishes a flame. A sour substance like cream of tartar, sour milk, or vinegar is called an acid.

A substance like soda is called a carbonate. Soda is also called an alkali.

There are some interesting experiments by which acids or alkalies can be determined. For this purpose paper that has been colored by a vegetable color is used. This is called litmus paper.

EXPERIMENT VII. Moisten a piece of blue litmus paper with vinegar. Is there any change? Try a piece of red. What is the result? *Acids turn blue litmus red.*

EXPERIMENT VIII. Dissolve one-half teaspoonful of soda in one-half glass of water. Test with both red and blue litmus paper. What is the result? *Alkalies turn red litmus blue.*

EXPERIMENT IX. Test the baking powder solutions in Experiments I and II. Is there a change? In a good baking powder the acid and the soda exactly balance each other and the paper shows neither acid nor alkali. *Such a mixture is said to be neutral.*

EXPERIMENT X. Test the vinegar and soda solution with litmus paper. Add more soda or vinegar, as indicated by the change in the litmus paper, until the mixture is neutral.

EXPERIMENT XI. Test the sour milk and soda solution with litmus paper. What is the result?

When sour milk and soda are used for bread, care must be taken that the acid and alkali are just balanced. Thick sour milk usually needs one teaspoonful of soda for two cups of milk. If the milk is thin, that is, not yet clabbered or formed into curd, less soda will be needed, as it is not so acid as when clabbered.

EXPERIMENT XII. Test sugar-house molasses with litmus paper. Is it acid or alkali? Molasses from a fresh can just opened has little acid.

EXPERIMENT XIII. To one-fourth cup of sugar-house molasses add one-fourth teaspoonful of soda dissolved in a tablespoonful of hot water. Stir well and note the result. Test with litmus paper. Is it acid, alkali, or neutral?

EXPERIMENT XIV. Test corn syrup with litmus paper. What is the result?

EXPERIMENT XV. Add soda solution as in Experiment XIII to the same quantity of corn syrup. What is the result? Judging by this could corn syrup be substituted for molasses in gingerbread recipe? What ingredient would have to be reduced in amount if corn syrup were used? Would the gingerbread be light enough without baking powder if corn syrup were substituted for molasses?

Kinds of Baking Powders. There are a number of baking powders in the market. They are sold under different names, but all may be classified as cream of tartar, acid phosphate, or alum powders.

Phosphate baking powder is made of calcium acid phosphate and soda with cornstarch. The cornstarch is generally used in greater quantities in phosphate baking powder than it is in cream of tartar powders. Phosphate baking powder does not keep well and should be purchased in small quantities. The alum powders contain soda, cornstarch, some form of alum, and various other ingredients. Repeat Experiment I, boil, and test for starch. (See Experiment I, page 43.)

What does the pure food law say about the kind of baking powders that may be sold? Read the label on your baking powder and see what its ingredients are. What are the ingredients of cream of tartar baking powder? Name some well-known cream of tartar baking powder. What kind do you use?

The Residue from Baking Powders. After the gas escapes from baking powder there is left a solid substance that may be injurious. Alum powders leave mineral salts that are considered very harmful. The solids from other baking powders are not injurious if used in moderate quantities. Buy a good quality of baking powder, in small quantities, as it loses its gas if kept long. Always keep it tightly covered.

If bread in which the acid does not balance the soda is used, the excess soda may interfere with the digestive juices. Soda and sour milk are far cheaper than baking powder, and if carefully used are not any more harmful.

Home Made Baking Powder. Baking powder can be made at home very successfully. Buy pure cream of tartar and bicarbonate of soda from a reliable druggist.

½ lb. cream of tartar
¼ lb. bicarbonate of soda
3 oz. cornstarch

Sift the soda and cornstarch together very thoroughly. Then shake in a covered glass jar until well mixed. Add the cream of tartar and shake well. Keep tightly covered. Use one teaspoonful to a cup of flour in biscuit and other quick breads. Use less in cakes where many eggs are used. For every egg added, deduct ½ teaspoonful of baking powder.

QUESTIONS AND PROBLEMS

How many ounces of baking powder are made by the recipe given above? What did it cost? What is the price of a cream of tartar baking powder? How much is saved by mixing it at home? What per cent is saved? What is the price of a pure phosphate baking powder? What is the cost of some alum baking powder sold in your market? Note the various names given for alum on the labels of cheap baking powders. Is it economy to save money by using for food any substance that may be injurious?

QUICK BREADS

Breads lightened by other means than yeast are sometimes called quick breads because of the short time needed for making and cooking them. As soft warm breads are usually imperfectly masticated, they should not be eaten frequently. Soda, either in baking powder where it may be combined with other minerals, or used with sour milk, leaves a residue that may be injurious. For these reasons it is much better to use well made yeast bread for your principal bread, and to eat the quick breads only occasionally.

Proportion of Liquid to Flour in Batters and Doughs. Quick breads are sometimes grouped as batters and doughs, according to their consistency or stiffness.

Pour batter .....1 part liquid to 1 to 1½ of flour
Drop batter .....1 part liquid to 2 to 2½ of flour
Soft dough .....1 part liquid to 3 to 3½ of flour
Stiff dough .....1 part liquid to 4 or more of flour

EXPERIMENT XVI. Measure a cup of flour. Sift and measure another cup. Compare bulk. Always sift flour before measuring, then sift again (one or more times) to mix dry ingredients.

Eggs as a Leavening Agent. A few quick breads do not depend on baking powder or its equivalent soda and an acid for a leaven, but are made light by the air and confined steam. Eggs are used for these breads, because a film of egg will hold the dough up long enough for it to be cooked. In popovers or cream puffs a hollow shell is desired, so the whole egg is beaten into the mixture. Where a spongy structure is required, as in sponge cake or angel cake, the whites are beaten separately and very thoroughly.

Popovers (Class Recipe ½)

Popovers and griddle cakes are typical of thin batters.

1 c. flour	¼ tsp. salt
1 c. milk	1 or 2 eggs

Sift and mix flour and salt. Mix the eggs and milk and add to the flour gradually. Beat with a dover egg beater. Turn the mixture into very hot greased gem pans or earthen cups, and put them into a very hot oven (about 475° F.). Keep the door closed for ten minutes. If they are browning at the end of this time reduce the heat very slightly. They should be well puffed and a golden brown at the end of thirty minutes. Then the heat may be reduced, or the oven door opened, to dry the rim of dough around the sides. About forty-five minutes is required for cooking. Serve as muffins or with a pudding sauce for dessert. Is the popover mixture a drop or a pour batter? What is the proportion of flour to liquid? Why is the egg beaten directly into the batter for popovers? (Experiment II.) Divide the recipe and mix one-half without beating; beat the other according to directions. Compare the product after baking.

Griddle Cakes

(Review Experiments IV, V, and XI)

Griddle cakes are not easily digested as they contain much raw starch, are too soft for thorough mastication, and are usually so greasy that they resemble fried foods.

Sour Milk Griddle Cakes

2 c. flour	1 tsp. soda
½ tsp. salt	2 c. sour milk
1 egg	2 tbsp. melted butter

Sift dry ingredients together and beat egg until light. Mix egg with one cup of milk, then add the flour mixture Beat thoroughly. Add enough more milk to make a batter like thick cream. Then add the butter.

Use a large griddle uniformly heated. Grease with a bit of fat on a fork or with a pastry brush with very little fat. Beat the mixture well just before putting on the cakes. Drop batter from the tip of a spoon, making the cakes round and of uniform size. When full of fine bubbles, but while still moist turn with a spatula or bread knife. If any part of the batter spatters out push it up to the cake so the edges will be smooth. When the lower side is brown serve immediately.

Sweet Milk Griddle Cakes

For sweet milk griddle cakes use the same proportions as in the recipe above, adding one tablespoonful of sugar, and using three teaspoonfuls of baking powder in place of soda.

What kind of batter is used for the griddle cake? Are griddle cakes easily digested? Are they easy to prepare? If the housekeeper cooks could she serve griddle cakes and preside over her table?

Muffins and Biscuit

As all breads contain starch they must be thoroughly cooked. Biscuits and muffins made small and thin may be well cooked in a short time.

Hand Test for Oven. For muffins the oven should be so hot that the hand cannot be held in it longer than the time required to count twelve or fifteen. For biscuit, count ten or twelve, counting as the clock ticks. The oven should be hot enough so that a piece of white paper put into it, with the door

closed, becomes a golden brown in five minutes. If a thermometer is available, test oven at 400° F., 425° F., 450° F., 475° F., and 500° F. Heat strips of white paper at these temperatures and paste in back of book for reference.

Wood or Coal Stove. Keep your stove free from soot above and below the oven. Remove the ashes before you begin to bake. For quick breads use small sticks of dry wood or a light coal fire. If large wood is used the oven will be slow to heat and there will be much fire left when the baking is finished.

Build the fire before measuring the ingredients, and do not mix the bread until the oven is almost hot enough for baking. If the oven heats too fast at the bottom put an asbestos mat in it.

Put the bread on the bottom of the oven until it is light, then place it on the top shelf to brown.

Gas Stove. Heat the oven for ten minutes with both burners. Put the biscuit on the upper shelf and bake for five minutes, then turn the gas low and cook from five to seven minutes longer. For muffins heat the oven ten minutes before putting in the muffins and cook for about eight minutes before turning the gas low. Then cook for another eight minutes.

If the oven burns the bottom of the bread, slip an asbestos mat under the pan a few minutes after putting it in, but not before the bread begins to rise. If the bread does not brown well on top it must be browned under the flame after it has cooked the required length of time. Gas pressure varies. Experiment with your stove until you find the best way of regulating it.

The Fireless Cooker. Put the radiators over the gas flame for about fifteen minutes. Test by putting a little flour on the stone; if it turns to a golden brown the heat is right for biscuit or muffins; if it burns, the stone is too hot and must be cooled. Put one radiator in the cooker, place the biscuit in the basket over it, put another radiator over it, on the rack, and close the cooker. The biscuit will be ready in ten minutes if the radiators were properly heated. If there are three radiators and two racks, two pans of biscuit may be cooked at once.

Pans for Quick Breads. Thin shallow aluminum muffin pans are best for cooking quick breads. Tin is not durable, and enameled ware gives a hard crust at the bottom and sides. For biscuit use flat aluminum or sheet steel baking sheets, or flat pans.

Preparing the Pans. Pans for muffins and butter cakes require greasing. When a pan is to be greased, warm either the pan or the fat. Then grease lightly with a clean pastry brush or a piece of kitchen paper. Use lard, beef drippings, or other unsalted fat for greasing. Never use butter as it burns easily and causes the bread to stick.

Making Muffins. Review directions for baking. Repeat Experiments I and II and note results. In which experiment was the more gas found? Why do muffins rise? Should muffins be mixed quickly or slowly?

The gas swells or expands when heated, but if the oven is not hot enough to bake quickly the gas bubbles run together and the bread becomes coarse in texture and may fall. If the oven is too hot, a crust forms before the bread can rise. The dough inside rises, when heated, and forms a peak in the center. Be sure to remember the two following points when using baking powder in bread: (1) mix the bread quickly, (2) put it immediately into a hot oven.

*** Light Muffins (Class Recipe ⅓)**

Muffins are not easy to digest as they contain fat, and are so soft that they are apt to be imperfectly masticated.

3	c. flour	1	tsp. salt
2	tsp. sugar	4	tsp. baking powder
1½	c. sweet milk	1	egg
3	tbsp. butter or lard (or one-half each)		

Have the oven nearly ready and the pans greased before you begin to mix the batter.

Sift the flour, salt, sugar, and baking powder together. Beat the egg slightly and add it to the milk. Then stir the milk into the flour. Mix it well but do not beat or stir very long. (Quick breads made of flour become tough if beaten or stirred too much.) Add the melted butter. As

soon as it is mixed pour the muffin pans two-thirds full. (If the pans are too full the mixture will run over when it begins to heat.) Brush the top with melted butter and bake.

QUESTIONS AND PROBLEMS

Give directions for preparing muffin pans. What kind of pan is used for muffins? Why? How is the oven heated for muffins? How long are they baked? Why are muffins mixed quickly? Why is a hot oven needed for muffins? What causes muffins to come to a peak when baking? What causes them to run over the edge of the pan? What makes them coarse in texture? Find the cost of one dozen muffins.

What food substances are found in muffins? How could the recipe be changed so as to make a richer muffin? A plainer one? What should be served with muffins to form a nourishing meal? Why do all breads need thorough cooking? Why must breads be eaten slowly and chewed well?

* Cornmeal Muffins (Class Recipe 1/6)

3 c. sifted cornmeal
1 tsp. salt
1 egg
6 tsp. baking powder
3 c. sweet milk
2 tbsp. melted butter

Proceed as for light muffins. As cornmeal has no gluten the gas escapes rapidly, so work very quickly. Have the oven slightly hotter than for light muffins. Bake for twenty-five minutes or longer.

* Boston Brown Bread

1 c. cornmeal
1 c. Graham flour
1 tsp. salt
2 c. sour milk
1 c. rye or whole wheat flour
1½ tsp. soda
¾ c. molasses

One and one-half cup sweet milk or water may be used with 2 teaspoonfuls baking powder and one-half teaspoonful soda.

Sift the Graham flour (add one-half of the bran from the sifter to the flour), and measure and add it to the other dry ingredients which have been sifted together. Mix as for muffins, stirring until perfectly smooth, and then turn into well greased molds, filling them two-thirds full. Grease the lids of the molds and cover closely.

Steaming the Bread. Place the molds on a rack in a kettle that can be closely covered and pour in enough boiling water to reach half way up the sides of the molds. Cover the kettle and keep boiling for three or four hours. (Do not let the water stop boiling or get too low. Replenish with

boiling water.) Remove the lid and bake bread in a moderate oven for fifteen minutes. Turn the bread from the mold while it is still warm. Serve cold, cut in thin slices. It is delicious when toasted. One pound baking powder tins make good molds, or small lard pails may be used. The bread made with water is to be preferred for sandwiches. Less molasses may be used if a sweet taste is objectionable; in this case reduce the quantity of soda and add a little water. Why is soda lessened if sweet milk or water is used? If corn syrup is substituted for molasses could the quantity of soda herein given be used? (Experiment XIV.)

Making Biscuit. Biscuits are more difficult to make than muffins be ause the dough must be handled. If the dough is very stiff the biscuit will not be light and tender. If too much flour is added the biscuit will be dry and hard. Some kinds of flour take more water or milk than others, *so use only enough liquid to make a dough of the right stiffness, even if it is not all that the recipe calls for.*

BISCUITS

Repeat Experiments II and III. Why do biscuits rise?

*** Biscuits (Class Recipe)**

Review directions for measuring.

Have all ingredients cold; attend to oven according to directions; take out biscuit pan, dredge-box, rolling-pin, and cutter; then wash the hands very carefully.

1 c. flour
¼ tsp. salt
2 tsp. baking powder
⅜ c. milk or water
1 tbsp. fat (lard, butter, or other cooking fat)

Sift the flour before measuring. Add the baking powder and salt, and sift twice. Put in the fat, which should be very cold. With two knives cut it into the flour until it looks granular, like meal. *Never rub the fat with the hands* or the biscuit will not be flaky. (It is not sanitary to put the hands in food any more than is necessary; moreover, they will warm the dough.)

Pour in a little of the milk, mix with a knife, then push the dough to one side and mix another part. When all is moistened turn on to a lightly floured board. If it does not turn out easily scrape it with a knife or spatula. (If the proper proportions of liquid and flour have been used the dough will not stick to the bowl.) Toss on the board with the spatula until lightly coated with flour and pat for one minute. Flour your rolling-pin a little and roll the dough lightly, from the center, into a sheet three-fourths of an inch thick. Cut with a small floured cutter. Lay on a shallow ungreased pan or baking sheet. Brush the top with milk or cream and bake according to directions. Judge your biscuit according to the score card given for bread on page 216.

QUESTIONS AND PROBLEMS

Give directions for mixing biscuit. Why is it best to have the ingredients cold? How much liquid should be used? What effect has much kneading on biscuit? Why not use the hands for the whole process of biscuit making? How thick should the dough be rolled? Why are small, thin biscuits more digestible than large thick ones? What kind of baking pan should be used for biscuits? Tell how to bake biscuits in your stove. Are the directions given here suitable for your stove? What ingredients in biscuits are apt to make them indigestible? Should biscuits be served to invalids? What food elements are found in biscuit? Why does fat interfere with the digestion of starches? (See page 55.)

How many biscuits can be made from a quart of flour? What is the cost?

Supplementary Recipes

Yorkshire Pudding (p. 347)
*Hot Water Corn Bread (p. 347)
Waffles (p. 347)
*Sour Milk Corn Bread (p. 348)
Dumplings for Meat Stew (p. 348)
Emergency Biscuit (p. 348)
Soda Biscuit (p. 348)
Whole Wheat Biscuit (p. 349)
Beaten Biscuit (p. 349)
Dainty Biscuit (p. 349)

CHAPTER XIV

BREADS (Continued). YEAST BREAD

Wheat is the most important of our bread stuffs. See geography for location of wheat fields and milling centers. Bring specimens of wheat, flour, bran, and rye flour.

Structure. The wheat grain is a small oval seed of a brownish yellow color. It has a hard outer covering, known as the husk, which is removed when the grain is threshed. Underneath this are fine layers of bran to which some starch and gluten adhere. Underneath these lie the gluten or protein matter. Next to this, but closely connected with it, are the starch cells. The germ, which is rich in oil, lies at one end. (See *A* in figure.)

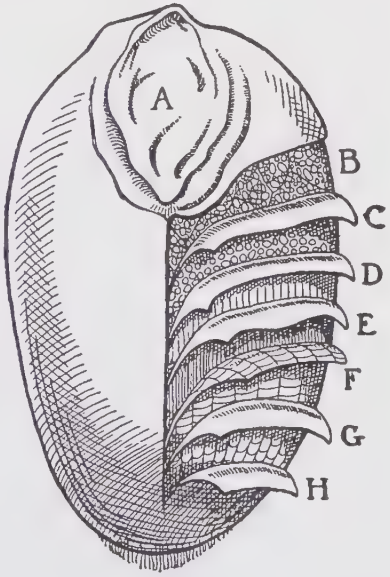


DIAGRAM OF GRAIN OF WHEAT

A. GERM
B. GLUTEN CELLS
C. STARCH CELLS
D. INTERIOR COAT OF BRAN
E. TESTA (COLORING MATTER OF BRAN)
F. INNER RIND
G. OUTER RIND
H. HUSK

Composition. (See table, page 116, for per cent composition.) Wheat is particularly valuable in the making of yeast bread because of its gluten content, which permits the dough to stretch and retain the gas.

FLOUR

Graham Flour. In the making of Graham flour the whole grain is ground and the bran retained. Some poor grades of Graham flour are made of low grade white flour with a little bran added. Graham flour is valuable for those with a tendency to constipation, as it stimulates peristalsis.

Whole Wheat Flour. This is made from wheat from which two coverings of bran have been removed; it is darker than ordinary white flour. It, too, is stimulating to peristalsis, owing to its oil and bran. As it has a high mineral content, bread made of whole wheat flour should be used if the diet is lacking in milk, fruit, and vegetables.

White Flour. In making white flour all the bran and the germ have been removed.

Pastry Flour. A high grade of white flour made from winter or soft wheat is known as pastry flour.

Rye Flour. Rye, like wheat, is used for flour. It is darker in color than wheat flour. Owing to the difference in the quality of its gluten it does not yield a loaf of the same lightness as does the wheat flour.

EXPERIMENT I. Examine and compare samples of all these flours. Sift and note the amount of waste material in each. What proportion of each passed through the sieve? How does the proportion differ?

Bleached Flour. Flour is bleached so that inferior grades may have the appearance of the best quality. In the bleaching process a chemical (nitrogen peroxide gas) is used, which leaves a trace in the flour. In buying flour see that the label states that it is unbleached. A dead whiteness may be due to bleaching, while a dark colored, slaty, or gray flour is poor. What does your pure food law say about bleached flour?

Selection of Flour. Wheat is classified as spring or hard wheat, and winter or soft wheat. Certain varieties of winter wheat, however, such as the Turkey Red wheat of Kansas, are known as hard wheats. Hard wheats yield a creamy, granular flour, rich in gluten, while soft wheats yield a white, smooth, starchy flour. The average flour is a blend of hard and soft wheat.

EXPERIMENT II. *Granulation and Color of Flour.*—Lay samples of different flour on a sheet of glass, arranging them in order of color. Compare these colors. How do the differences correspond with the quality of the flour? Examine the flour with a microscope, noting any coarse or dark-colored particles of bran or dust. Rub some of the flour between the thumb and forefinger. Note if any granular particles can be detected. Can the texture be determined by the appearance?

The odor is a most important point in selecting flour. If it is at all sour the flour is spoiled; if musty or rancid do not use it, as the mustiness is more apparent after the flour is made into bread.

Qualities of Good Bread Flour. Good bread flour is of a creamy white, is quite granular or grainy, and does not hold its shape when the hand is opened after the flour has been pressed together. It should feel dry rather than moist. The quantity of water taken up by the flour is an important point —from sixty to sixty-five per cent of its weight of water should be absorbed.

Pastry Flour. Good pastry flour is smooth and white and holds its shape when pressed in the hand.

Keeping Flour. Good white flour made from first class wheat improves with age if kept for a few months in a cool, well ventilated place. Flour made of poor material cannot be kept. If good flour can be procured buy it in quantity in the autumn. Graham or whole wheat flours do not keep well on account of the oil. Keep flour in a cool, dry place.

Composition of Flour. What food elements are found in flour? (See Table, page 116.) Wheat contains a sticky protein known as gluten. This varies from a high per cent in fine hard wheat to a small per cent in soft wheat.

EXPERIMENT III. Review Experiment VIII, page 45. If the gluten is dark and stringy the flour will not make good bread. What particular quality does such flour possess? Good flour should have at least thirty per cent of moist gluten. Bake a part of the washed dough and note appearance. What are the properties of gluten? Test Graham and whole wheat flour in the same way.

EXPERIMENT IV. Review Experiment III. Wash dough in ½ c. water, boil water, and test for starch. See Experiment I, page 43.

CORNMEAL

Cornmeal is an important breadstuff in this country. It does not contain gluten and cannot be used for yeast bread. Only clean corn free from smut or weevils should be used for making meal. It is made by two processes known as the new and the old. In the new process a part of the germ is removed, and this gives meal of a peculiar flavor, which is poor in oil and takes up much liquid. Good cornmeal is a creamy white or yellow in color, never gray or dingy. It has a sweet pleasant odor and has no trace of mustiness. It grows rancid quickly on account of its oil. It must be free from web-like bits, as these contain the larvae of insects. Keep it in a clean, dry place. Since meal does not keep as well as flour, it should be purchased in small quantities.

QUESTIONS AND PROBLEMS

In what part of this country does wheat grow? Where are the great milling centers? Where was your flour manufactured? Where was the wheat grown? Tell what you can of the manufacture of flour.

Why is wheat so well adapted to bread making? What is Graham flour? Whole wheat flour? What is their special value? What part of the grain is used in white flour? What is the difference between spring and winter wheat? Which would make the best bread flour? Why are blended wheats used for flour? Compare samples of different flours as to color, texture, odor, and the way in which they hold their shape when pressed in the hand. What is the composition of flour? How can the starch be separated from flour? The gluten? How should flour be kept? Would you buy a quantity of flour at one time?

Why cannot cornmeal be used for yeast bread? How may cornmeal be judged? What is the difference between the new and the old process meal?

YEAST

The best and most healthful bread is lightened with yeast. Yeast is a tiny plant, so small that it cannot be seen with the naked eye. It reproduces itself by budding as shown in the picture of yeast cells; that is, new cells form on the old ones, or it

produces spores which may be compared to seeds. (See page 108.) When it is planted in starchy or sugary substances it grows very fast and forms a gas from the air and from some of the substances in which it grows. This is the same gas that was formed by the baking powder, carbon dioxide. The gas does not form as quickly in the yeast dough as it does in the baking powder bread, because several hours are needed for the growth of the yeast plant. In a mixture of flour and water and yeast kept at a temperature of from 70° to 80° F. a part of the starch of the flour is changed to sugar. This sugar then changes to alcohol and carbon dioxide, the gas that causes bread to rise. If the rising process is carried on too long so that other bacteria have a chance to grow, or, if owing to careless handling many other bacteria enter, the alcohol may be changed into an acid and the bread may become sour.

YEAST CELLS

The yeast plant needs food, oxygen, warmth, and moisture just as any other plant does. The flour and sugar are its food; the water or milk gives moisture; while the air beaten or kneaded in furnishes it oxygen. The dough must be kept warm. If all these things are supplied, and the yeast used is good it will grow just as any plant in the garden grows if it has the needed soil and climate. Think of the yeast cake as a package of tender growing plants and handle it as a box of delicate plants should be handled.

Compressed Yeast. Compressed yeast is made in the large distilleries or factories where whiskey is made. Whiskey and beer are both made by the fermentation of grains caused by the growth of yeast plants. In the distilleries the scum on the top of the vats is composed of millions of yeast cells. This scum is skimmed off, mixed with cornstarch, and formed into small cakes. These cakes are wrapped in tinfoil and kept very cold until they

are sent to the housekeeper. The plants do not grow when cold but as soon as they become warm they begin to grow. Compressed yeast can be kept very cold for a short time only, as the plants die when exposed to cold for a long time. Yeast cannot be kept in a warm place because the plants grow, and after growing a while the yeast becomes sour and loses its strength. A good compressed yeast cake is of a creamy whiteness, free from dark spots or streaks, and has a pleasant odor.

Dry Yeast. A cake of compressed yeast was compared to growing plants. Dry yeast may be likened to a package of seed. If seeds are planted, more time is needed for their full growth than for the growing of young plants. Likewise dry yeast needs more time for growth than compressed yeast. It is best to start the bread at night so that the seed will have plenty of time to grow. A dry yeast cake must be soaked for half an hour before it is put into the dough.

EXPERIMENT V. Examine, under the microscope, a group of yeast cells grown in a molasses solution as in Experiment II.

EXPERIMENT VI. Dissolve three-fourths of a cake of compressed yeast in two cups of water to which one tablespoonful of sugar has been added, or use a thin mixture of sugar, water, and flour; or a mixture of molasses and water. Divide the mixture into three test tubes or flasks. Expose one to freezing temperature. Boil the contents of another tube, then cool and set away. Put the third in a warm place (about 90° F.). Dissolve the remaining yeast in a test tube half filled with pure water. Let stand for an hour, noting changes every fifteen minutes. Compare the results. At what temperature was growth most rapid? In what tube or flask was there no growth? Test for carbon dioxide, the tubes in which gas formed, with lime-water and a burning match. (See Experiments V and VI, page 197.) Do not heat the tubes. What can you say of the food and temperature required by the yeast plant? Keep the tubes in a warm place until the second day and then note odor and other conditions.

The Making of Yeast Bread. All bread recipes are based on a certain proportion of liquid to flour, the usual quantity being one cup of liquid to three or four of flour. This quantity will make one loaf of bread. Winter wheat flour takes up more liquid than spring wheat or the blended flours. The quantity

of shortening or fat used, too, modifies the quantity of liquid, for shortening acts as a liquid.

The amount of yeast required varies from one-eighth cake to two cakes, depending on the length of time allowed for rising and upon the amount of gluten in the flour. With a strong flour, that is, one rich in gluten, more yeast may be used, as the dough will stand a greater pressure of gas. One-fourth cake to each cup of liquid is satisfactory for ordinary use. For quick process bread, one-half cake should be used. Too much yeast gives a dry and porous loaf that crumbles easily. Too little yeast requires a long time for rising, and the bread may become sour because of the growth of other bacteria.

Sugar is a good food for the yeast plant and from one-half to one and one-half teaspoonfuls to one cup of liquid may be used. In making sweet breads with a large quantity of sugar it is best to use the sponge process and to add most of the sugar at the second mixing, as it may ferment in the presence of yeast and the bread become sour.

Salt is apt to retard the rising of bread, if used in large quantities. One-half teaspoonful to one cup of liquid is sufficient.

GENERAL RULES FOR BREAD MAKING

1. Scald liquids to destroy germs, and in the case of milk to prevent souring in the bread.

2. Mix hot liquids in a large bowl with sugar, salt, and shortening; cool until only lukewarm before adding yeast cake. (Lukewarm water is just a little warmer than the hand.) Be very careful in making yeast bread not to use anything hot about the yeast as the little plants are killed if the dough gets too hot.

3. Rub compressed yeast to a paste in lukewarm water. Soak dry yeast one-half hour in lukewarm water.

4. Have flour at temperature of about 70° F. If too cold the bread will rise slowly. Do not heat it very hot if it must be warmed.

5. Warm bread pans, board, and rolling-pin (in cold weather), and mix bread in a warm room.

6. Beat batter for five minutes before it is very thick; in this way more air is beaten in and the dough will be light.

7. Put bread to rise in a warm place; a temperature of 78° F. is best for the growth of the yeast plant.

8. Knead bread thoroughly after each rising so that gas bubbles will be evenly distributed. Study kneading directions carefully.

9. Always brush the top of dough and loaves with melted fat or lukewarm water to prevent a crust from forming before the bread rises.

Sponge and Short Processes. Bread may be made by what is known as the sponge process. A thin batter or sponge is first made as in Grilled Muffins. When this is light, enough flour to make a dough is added. After kneading it is left to rise, then molded into loaves, and these, when light, are baked. This method requires more time as the bread rises three times, but the process usually gives a fine grain.

In the short process all the flour is added in the beginning as in the recipe for Yeast Bread. This requires much less time than the sponge process, and if thoroughly kneaded a good grain is obtained.

Grilled Muffins (Sponge Process)

½ c. scalded milk, cooled till lukewarm
½ tbsp. butter
⅛ cake yeast
1 tbsp. sugar
⅛ tsp. salt
½ c. flour

Put the yeast cake in a cup and pour two tablespoonfuls of the milk on it. Let stand for a few minutes, then stir to a smooth paste. Put the scalded milk, sugar, salt, and shortening into a small mixing bowl. Stir well and add the yeast, paste, and flour. (Put all the flour in at once.) Beat well for five minutes and put in a warm place. When light, prepare a griddle as for cakes. Lay small greased muffin rings on it, and when hot fill half full of the muffin mixture. Cook over a moderate heat until the dough is light and well browned on the under side; then turn the muffins and ring with a spatula or broad knife-blade and brown the other side. This method may be used where no oven is available, but the muffins are more digestible if cooked in an oven. One tablespoonful of beaten egg will improve the muffins. These muffins should be eaten sparingly, as they are no more digestible than griddle cakes.

*** Bread (Short Process—Class Recipe ¼)**

1 c. scalded milk (2 c. milk if no water is used)
1 tsp. salt
1 tbsp. butter or lard
6 to 8 c. flour
1 c. boiling water
2 tbsp. boiled water cooled to lukewarm
1 tbsp. sugar
½ to 1½ yeast cakes (depending on time for rising)

This makes two loaves. Two groups of pupils may use one pan for baking, each putting in a small loaf. If dry yeast is used, start it at home at night; if compressed yeast is used, start in the morning, unless it is to be used very early, then use less than the given quantity of yeast and start it at night.

Proceed as for Grilled Muffins adding half the flour. After beating add enough flour to make a stiff dough. Scrape the dough from the bowl on to a lightly floured board and knead thoroughly. Do not work in too much flour.

To Knead Bread. Flour the hands lightly and sprinkle a little flour on the dough. Use the mound of the hand at the back of the palm for kneading. Do not put the fingers into the dough. Pull the bread toward you, then push it back. Work lightly; do not press too hard or a great deal of flour will be taken up. Knead until the dough feels like velvet and comes back quickly when pressed with the finger. Bread is kneaded to incorporate air and to stretch the gluten of the flour so that the grain of the loaf will be fine.

Putting Bread to Rise. Moisten a large mixing bowl with warm water, place the ball of dough in it, brush the top with lukewarm water, and put the bowl in a pan of warm (not hot) water. Cover with a clean cloth and a pan; put it in a warm place where no cold air can reach it until it rises to twice the size it was originally. Add a little hot water to the pan when necessary to keep it warm.

Forming into Loaves. When the bread is well risen, knead very thoroughly to distribute gas bubbles. (Be careful not to work in much flour.) Cut off a piece of suitable size and form into a loaf, place it in a greased pan, cover, and let rise in a warm place until it has doubled its bulk. Bake as directed on following page.

EXPERIMENT VII. Knead a piece of biscuit dough as directed for Yeast Bread. Bake and note quality. Could baking powder be used for gas in kneaded bread? Explain answer. Why can yeast be so used?

Bread Pans. Small pans that hold a single loaf are best for bread as they give a greater proportion of crust. A pan

$7\frac{1}{2}\times3\frac{1}{2}\times2\frac{3}{4}$ inches gives a very good loaf. Sheet iron or aluminum pans with round corners are to be preferred.

Baking Bread. Cook yeast loaves in a moderately hot oven; the heat may be slightly reduced after the bread begins to brown. Bake small loaves for fifty minutes and large loaves longer. The bread should begin to brown in fifteen or twenty minutes from the time that it is put into the oven. When it is done the loaf will seem light and no steam will come from it.

To bake loaves, heat the gas oven with both burners for five minutes before putting in the bread. Cook for ten minutes and then turn off one burner. Turn off the heat entirely ten minutes before the bread is done. When using a wood or coal range put the bread in a moderately hot oven and reduce the heat after it is well risen and partly browned.

For rolls, heat a gas oven for eight minutes. Put in the rolls and turn off one burner after the rolls are slightly browned. Cook for the last five minutes with the heat off. In a wood or coal oven proceed as for bread, having the oven slightly hotter.

Good Bread. Flavor and texture are the two important points in grading bread. The loaf should be of pleasing shape and should be light, with a rich, crisp, brown crust. The crumb should be firm, tender, and fine grained. It should have a rich nutty taste with no trace of acid or moisture. Under-cooked bread will cause indigestion.

SCALE FOR GRADING BREAD*

Flavor	35
Lightness	15
Grain and texture	20
Crust—color, depth, texture	10
Crumb—color, moisture, elasticity	10
Shape and size	10

Keeping Bread. As soon as bread is taken out of the oven lay it on a wire rack to cool and protect it from dust with a clean thin cloth. After the bread is cold put it away in a metal bread box that has perforations to admit air. Keep your bread box

*From Bulletin of University of Illinois, by Isabel Bevier.

very clean. Scald it and dry thoroughly before putting in a fresh batch of bread.

* Parker House Rolls

(Rolls are to be preferred to loaves in the lesson on account of time needed in making.)

*Use one-fourth the bread recipe, but instead of molding into loaves roll like biscuit to half an inch in thickness. Cut with a large biscuit cutter and crease across the center of each roll with the back of a knife-blade. Brush one-half with a very little melted butter, and fold over at the crease. Brush the top with butter and lay the rolls in a greased biscuit pan. Press your thumb in the center of each roll on the folded side so as to form a sort of crescent. When light bake for twenty-five minutes in an oven not quite as hot as that for biscuit.

PARKER HOUSE ROLLS

Caution. The rolls will pop open if put to rise in a very warm place or if put in too hot an oven.

* Graham Bread

(No. 1)

¼ cake compressed yeast (or ¼ cake dry yeast)
1 pt. milk
1 pt. white flour

(No. 2)

1½ tsp. salt
1 c. dates stoned and chopped
3½ c. Graham flour
1 c. pecan meats chopped fine

Make a sponge of the ingredients in group one. Put it in a warm place to rise. Such a thin batter will not rise much, but when light will be full of fine bubbles and foamy on top. Add the other ingredients, using enough Graham flour to make a dough that can be kneaded. Knead well, return to the bowl, and when nearly double in bulk mold into loaves and let rise and bake. Graham bread does not rise as much as white bread.

*Note to Teacher. Prepare the dough according to bread recipe and have it light when pupils come. Give each group a portion and have pupils knead it well and form it into rolls as directed. While the rolls are rising have pupils make bread and set to rise for use by a later class. The pupils must get the whole process.

Baking. In baking Graham or whole wheat bread the oven must be hotter at first than for white bread so that the rising process shall be checked quickly. Reduce the heat after the first fifteen minutes and finish the cooking as for white bread.

Moisture of Graham Bread. Graham and whole wheat bread are often moist. This is because they have risen too rapidly or the rising process has gone on too long. The protein of the bran has the power of converting a part of the starch into sugar and this makes the bread moist. It is best to use a smaller quantity of yeast for these breads and to start the sponge with white flour. If dry yeast is used set the sponge the night before.

Whole Wheat Bread

1 tsp. salt
¼ c. molasses
2 tbsp. lukewarm water
2 c. white flour
1 pt. scalded milk
½ cake yeast
about 4 c. whole wheat flour

Make a sponge of the milk, yeast, and white flour as in Graham bread. When light add the other ingredients and mix well. Let rise, then knead very slightly and form into loaves and biscuit with the hands.

USES OF STALE BREAD

All bits of stale yeast bread may be utilized. The large pieces may be used for croutons, dry or milk toast, or for hot meat sandwiches. Meats, eggs, or vegetables may be served on toast. The smaller pieces may be cut into cubes or points for garnishing or for serving with soup, or used in puddings, or for stuffed or scalloped vegetables. The very small pieces may be made into bread crumbs and combined with meat or vegetables, used in puddings or for crumbed dishes. No part need be wasted, provided the bread is kept in a clean dry place.

*** Toast**

(See Effect of Cooking on Starches, page 117)

Why is toast more digestible than other breads?

For toast use bread at least twenty-four hours old. Cut the bread in half-inch slices. Line a baking pan with kitchen paper and lay the slices

in it. Put the pan in a moderately hot oven until the bread is well dried. Then brown it under the gas flame and turn when one side is brown. A golden brown with no burnt edges is the proper color for toast. The inside of the bread must be crisp, not moist. Butter as it is eaten. Left-over toast may be reheated and used as if fresh. When using a wood stove dry the toast in the oven or on the front of the stove and brown over the coals.

Croutons

Cut the bread as for toast, then cut in inch squares or in three-fourths inch strips. Toast, increasing the heat after the bread is dried. Stir with a fork so that all sides will be browned. The crust may be removed if desired.

Toast Points

Cut the bread in triangles, remove the crust, and proceed as for toast.

Croustades

Cut firm, fine grained bread into slices two inches thick. Trim the slices into two and one-half inch squares. Remove a square from the center of the top, leaving one-half inch on all sides and half an inch at the bottom. Toast to a very light brown in color. Remove from the oven, and brush the inside and top with melted butter, and fill the center with creamed vegetables or meats. A round cutter may be used for the croustades.

Bread Crumbs. (See page 126.) If large quantities of crumbs are to be prepared use a bread crumber.

To Cut Bread. Never cut bread while it is warm. Use a sharp knife and cut with a sawlike motion. Do not press on the knife or squeeze the bread with the hand. Cut in thin, even slices. In cutting fresh bread the knife should be warmed. Heat the knife by putting it into hot water. Leave it for a few moments; then wipe quickly and reheat as needed.

Baker's Bread. If baker's bread that equals the home-made bread in flavor and quality can be obtained it will save the housewife much time and labor in bread making. If baker's bread must be used, visit the bakeries and select the best, applying the standards for judging bread. Be very careful to note the sanitary conditions of the shop, and, if possible, buy wrapped bread. Bread should be wrapped as soon as it has been properly cooled. Why? To wrap bread by hand does

not cost quite one-fourth of a cent per loaf; wrapped by machinery, on a large scale, it is much cheaper. If bread is wrapped after being thoroughly cooled and dried on racks the flavor will not be injured.

SANDWICHES

The Bread. The most important thing in making good sandwiches is to have good bread. Select a fine-grained loaf that is one day old. Cut the bread very thin. White, rye, Graham, brown bread, tender rolls, or biscuit may be used. Cut bread in triangles for lettuce, nut, and celery sandwiches; in oblongs for meat sandwiches; and in rounds for cheese or sweet sandwiches. Other fancy shapes may be used.

Removing the Crust. For fancy sandwiches the crust is removed. If you are skillful in slicing bread, peel the crust from the loaf, then slice; if not, slice thin, then trim off the crusts with a very sharp knife.

The Filling. In putting the filling in a sandwich be sure to cover all the bread. A sandwich with a little filling in the center and dry crust around the edges is good neither to eat nor to look at.

Do not select highly flavored fillings such as sardines or canned meats for picnic sandwiches, as they cause great thirst. If the filling is moist it must be put in just before serving; otherwise the bread will be wet and heavy.

For meat sandwiches very tender meat, either beef, mutton, or boiled ham, may be sliced thin and cut in small pieces, or it may be ground through a meat chopper and seasoned with butter, salt, a little chopped parsley, tomato catsup, or Worcestershire sauce. Grated or toasted cheese and cottage cheese with chopped olives or nuts make good sandwiches.

Among the vegetables, tomatoes peeled and sliced, crisp celery with nuts and Mayonnaise, or lettuce and nuts with French Dressing or Mayonnaise are delicious. Vegetable sandwiches should be served soon after they are made.

Wrapping Sandwiches. Wrap in oiled paper, not more than four together.

QUESTIONS AND PROBLEMS

Why is good yeast bread the most healthful form of bread? (See Quick Breads, page 199.) What is yeast? Describe compressed yeast. Dry yeast. Which do you prefer? Why? What does the yeast plant require for growth? How are these things provided? What temperature suits the yeast plant? What happens if it gets too cold? Too hot? Tell how to mix bread. Why does yeast cause bread to rise? With which flour may more yeast be used, a creamy granular one or a white smooth one? Why? What is meant by the sponge method? Why is bread kneaded? Give directions for baking bread. What is the result if the oven is too slow? Too hot? Why should yeast bread be thoroughly baked? How can a loaf of bread be judged? Score a loaf according to the standard. How should bread be kept? How may stale bread be used? What food elements are found in bread? What should be served with it to make a healthful diet? What digestive fluids have most to do with bread? (See pages 48 and 49.) What is the cost of a loaf of bread including fuel used in cooking? What grade of flour do you use for bread? How much does it cost? Has it much gluten? How much water does it absorb?

Visit your bakery and note the following conditions: quality of flour; kinds of fat; quality of product; cleanliness of the mixing process; conditions under which wrapping is carried on; general sanitary conditions; presence of flies, rats, and roaches, etc.; health of workers.

Supplementary Recipes

Bread Sticks (p. 349)
Hot Cross Buns (p. 349)
Swedish Tea Bread (p. 350)
Coffee Cake (p. 350)
Paste for Coffee Cake (p. 351)
*Sweet Sandwiches (p. 375)
Ham Sandwiches (p. 376)
*Hot Meat Sandwiches (p. 376)
*Lettuce Sandwiches (p. 376)
Bread and Butter Rolls (p. 376)
Aviation Sandwiches (p. 376)
Pimento Sandwiches (p. 376)
Salad Rolls (p. 376)
Biscuit Sandwiches (p. 377)
Brown Bread Sandwiches (p. 377)
*Milk Toast (p. 351)

CHAPTER XV

FATS AND OILS

Composition of Fats

Article	Water	Protein	Fat	Carbo-hydrate	Fiber	Ash	Calories per lb.
Butter	11	1	85	...	..	.3	3605
Cottolene	...	...	100	...	..	..	4220
Lard, refined	...	...	100	...	..	..	4220
Oleomargarine	9.5	1.2	83	...	..	6.3	3525
Tallow	...	...	100	...	..	..	4220
Almonds	4.8	21	54.9	17.3	.2	.2	3030
Cocoanut	14.1	5.7	50.6	27.9	..	1.7	2760
Chestnut	45	6.2	5.4	42.1	1.8	1.3	1125
Peanut	9.2	25.8	38.6	24.4	2.5	2	2560
Pecan	3	11	71.2	13.3	..	1.5	3455
Walnut	2.5	16.6	63.4	16.1	2.6	1.4	3283

Fats and oils form one of the most important food groups. Oils are fats that are liquid at ordinary temperatures; olive and other salad oils are examples.

Fats and oils are made up of three substances, some more solid than others. These are *stearin, palmitin,* and *olein.* If there is a large per cent of stearin the fat remains solid until heat is applied; tallow, the fat from beef or mutton, is an example. If the proportion of palmitin is great the fat is solid at ordinary temperatures. Butter is an example of this class of fats. If there is much olein the fat remains liquid unless the temperature is very low. By mixing fats which contain these ingredients in different proportions, compounds are made. In some cases the different substances in the fat may be separated by alternate heating, pressing, and cooling; in this way oleo

oil, used in oleomargarine, is obtained from tallow. Cottonseed oil is much used with tallow to make certain cooking fats.

In our climate both vegetable and animal fats are used. Butter, lard, and tallow are from animals; olive oil, peanut oil, and cottonseed oil come from the vegetables.

Cooking Fats. Many fats are used for food and in its preparation. Butter and olive oil are used uncooked. For cooking purposes lard, compound lard, and oleomargarine are used. The recipes in this book call for lard and butter, but other fats may be substituted. Remember, however, that some fats contain a greater proportion of water than others, and are therefore poorer in fat. For example, according to the table of composition, lard is 100% fat; butter is 85% fat. If lard is used instead of butter, a smaller quantity is required. What fats do you use for pastries, frying, and seasoning?

Lard is made from the fat of the hog; leaf lard from the sheets of fat in the body cavity is the choicest.

Compound Lard is usually composed of lard stearin, beef stearin, and cottonseed oil; sometimes no lard is used.

Uncolored Oleomargarine is a cheap cooking fat. It contains from 20 to 25% oleo oil (oil from tallow), 40 to 45% lard, 10 to 25% butter, 5 to 30% milk, cream, salt, and other ingredients.

Renovated Butter is made by melting old and rancid butter, aerating it, and churning it with skim milk; it is then salted and worked.

Cottonseed Oil is used to adulterate olive oil and as an ingredient in compound salad oils. Alone or combined with other fats, such as lard or tallow, it is used in various cooking fats that take the place of lard.

Olive Oil is a valuable food but it is often adulterated with cottonseed, peanut, and other oils; these oils may not be objectionable, but such adulterations defraud the purchaser. Buy a reliable brand and read the labels carefully.

Food Value. Fats are of great importance in the diet. (See page 40.) A diet too low in fat may disturb nutrition, but

too much fat may cause indigestion, so that in planning menus one must regulate the amount of fat. In cold weather more fat may be eaten than in warm weather. Why? (See Table.) What fats do you use for food? Remember that a rich gravy contains fat, hence if such a gravy is used little butter is needed. If bread is eaten with jam or other sweets the bread should be buttered unless an abundance of fat is eaten in some other form, since sweets do not take the place of fat in the body.

The Spoon Test. There are various tests for adulterants in fats; the spoon test is very simple. Test oleomargarine, renovated butter, and pure butter by this method. Put a little of the fat in a tablespoon, melt gradually, then increase the heat and bring to as brisk a boil as possible. After boiling has begun, stir the contents of the spoon thoroughly (not neglecting the outer edges) two or three times at intervals during boiling and shortly before the boiling ceases. Oleomargarine and renovated butter boil noisily, sputtering (more or less) like a mixture of grease and water, and produce little or no foam. Renovated butter usually produces a very small amount of foam. Oleomargarine has a meaty odor like that of cooked meat; one who is familiar with good butter can detect oleomargarine immediately. Genuine butter generally boils with less noise (unless it contains much water) and produces an abundance of foam.

QUESTIONS AND PROBLEMS

What is the difference between oils and fats? Mention several oils and fats. Which ones are used by your family? Are they pure or compound? What fats and oils are in general use in this climate? Are they obtained from animals or vegetables? What is the price per pound of butter, lard, compound lard, and some of the cottonseed compounds? Of olive oil per pint? Of other salad oils? What does your pure food law say about olive oil? Is much artificial butter used in your community? Give the spoon test for butter. If a recipe calls for one cup of butter, and lard is substituted, how much of the latter will be required?

Of what use are fats and oils to the body? Tell what you can of the digestion of fat. Why is more fat needed in cold weather than in warm? Is ham a good hot weather food? Give reason for your answer. Why is

food that is very rich in fat apt to be slow in digesting? Why is food that is covered with fat indigestible? Why is overheated fat objectionable?

The Care of Fats. Fats become rancid or decompose. This change goes on rapidly in a warm place. All fats should be kept as cold as possible and protected from the air. Rancid fats have undergone a chemical change and the products of this change are very irritating to the digestion. Much fat is thrown away that could be utilized; if not used as food, soap may be made from it. Fats from stews and soups made of fresh beef, pork, or mutton may be used in cooking. When the soup or other liquid cools, lift off the fat with a skimmer, put it into a saucepan, heat it gently until it is quite hot and has ceased bubbling (it bubbles because of the water in it), and strain through a cheesecloth into a clean bowl that can be closely covered.

Home Rendered Fats. Fats are prepared for use by being rendered; that is, the fat is cooked gently until its connecting tissues shrink and the fat liquefies; it is then drained from the membranes, which are known as "cracklings."

Remove all flesh from the fat, wash it clean, cut in small pieces, and cover with cold water for several hours. Then drain off the water and add one cup of water to each two pounds of fat. Less water in proportion will be needed for a large quantity of fat. Cook over a low fire until the fat is clear and the membranes are a golden brown. Strain through a cheesecloth and press the membranes together in the cloth to remove all of the fat. This last fat will not be very clear. Cook mutton suet in a double boiler, using a cup of milk to each two pounds; when the fat is extracted let it cool, remove the cake of fat, melt it over a low fire, and add from one-fifth to one-half of rendered lard; strain into jars while hot.

Beef Fat. The fat from the flank and loins, particularly that of fat cows and heifers, has less stearin and is much softer than ordinary tallow. It is bought by many persons who do not use pork fat. In preparing it no lard is added.

Making Lard. Fat for lard must be kept in a cool, airy place. The fat from around the entrails spoils quickly. Wash

it in soda water (one tablespoonful of soda to one quart of water) and cook it as soon as possible. Follow directions for home rendered fats. If lard is even slightly scorched the flavor is unpleasant. Render the leaf and other internal fat separate from the outside fat.

Bacon Fat. This may be used without further preparation for frying, for greasing pans, and for basting meat and fish; if from salt bacon, not smoked, it may be used for shortening. Fat from sausage may be used for frying such foods as have a flavor which will not be affected by it.

Fats for Soap Making. Any rendered fat not fit for food may be saved for soap making. Home-made soap is not as good as the factory product; therefore it is well to sell the fat and buy soap ready made. Clean, light colored fat brings from three to four cents per pound. In some towns it may be sold directly to the factories; in others it is collected by junk men. Keep soap fat as clean as possible.

EXPERIMENT I. With fat saved in the kitchen make a small quantity of soap, using the formula from the concentrated lye can. Compare this with the manufactured product.

QUESTIONS AND PROBLEMS

What is meant by rancid fats? Are they fit for food? Give reasons for answer. How should fats be stored? Tell how to save all fat so that it may be used. Describe the process of rendering fats. Tell how lard is made. Do the soap factories in your town buy fat from the housekeepers?

How Fat Is Affected by Heat. Fats when heated decompose or break up and form irritating compounds. This change takes place at different temperatures according to the nature of the fat. In butter the decomposition point is quite low; therefore it is one of the poorest fats for frying, and as it scorches easily it should not be used for greasing pans. Lard has a higher decomposition point than butter, and is therefore better adapted for cooking. Tallow also decomposes at a high temperature, but

when foods cooked in it are cold they have a disagreeable flavor. Tallow may be used, however, if mixed with lard. Olive oil is the best for cooking as it may be heated very hot before breaking up, but it is too expensive for ordinary use.

EXPERIMENT II. Heat, separately, lard, butter, and tallow (tallow is the rendered fat of beef, veal, or mutton) and other cooking fats until the bubbling ceases. Fat bubbles because there is water in it. When the fat becomes hot enough the water goes off in steam and the bubbling stops. Did any of the fats burn before the bubbling stopped? Butter decomposes at a temperature of 206° F., tallow at 302° F., lard at 392° F., and olive oil at 608° F. In fried foods the fat is always overheated; such food is very difficult to digest.

EXPERIMENT III. Heat fats as in Experiment II for thirty minutes, and note appearance.

To Clarify Fats. Fat that is overheated becomes dark or burned and may be clarified by cooking a few slices of raw potato in it. Cook until the potato begins to burn, then strain through cheesecloth and let it settle. Compare the odor of clarified fat with that of fresh fat. Remember that continued heating increases the indigestibility of fat.

FRIED FOODS

EXPERIMENT IV. From Experiment I it has been determined that lard, a vegetable oil, or some of the compounds is the best cheap fat for frying. How hot shall it be heated? *Put fat over fire in a cold pan. If it is put into a hot pan the odor is very disagreeable.* Heat some lard until it bubbles. Drop in a small cube of bread and cook for one minute. Heat the lard until it smokes and is perfectly still. Cook another cube of bread in it for one minute. Then compare the two. Break them open and determine which has absorbed the more fat. *Fat must be smoking hot for frying.* Can butter be heated as hot as this? Why not? (See Experiment II.)

EXPERIMENT V. Cook a slice of potato in a little fat, not enough to cover. Cook another in deep fat. Which has taken up the more fat?

Fried foods should be cooked in deep, hot fat and be well drained. Even if carefully cooked, however, they are not easily digested, and should be eaten sparingly if at all.

Temperature of Fats Used for Frying. Fats for most uncooked foods should be hot enough to brown an inch cube of bread in sixty seconds. Fats for croquettes and other cooked mixtures and for fish and oysters should brown the bread in forty seconds. These cooked mixtures need only to be quickly reheated, but fish and oysters, because of the moisture in them, lower the temperature of the fat into which they are put so much that it should be very hot before they are put in.

Caution. *Put the foods to be fried into the fat with a skimmer or spatula, keeping the hands and face as far away as possible. Fat sputters when cold or moist substances are put into it and one may be badly burned. Smoking hot fat is much hotter than boiling water and burns deeply. Keep a pan of sand near at hand to pour into the fat if it takes fire. Never put water into hot or blazing fat.*

How to Treat Fats Used for Frying. Put the fat in a warm place to settle. Then strain through a cheesecloth into a clean vessel. Clarify when it becomes dark.

*** Fried Potatoes. (Half Potato for Two Pupils)**

Pare medium-sized potatoes, slice thin, and let stand in cold water for an hour. Dry on a soft cloth. Why dry potatoes? Cook in deep fat to a delicate brown. Drain on kitchen paper, sprinkle with salt, and serve.

Meat Croquettes

2 c. chopped veal or chicken
⅛ tsp. paprika
1 tsp. lemon juice
1 tbsp. shredded parsley
1 to 2 c. thick white sauce
¼ tsp. celery salt
5 drops onion juice
salt to taste

Equal amounts of meat and sauce are generally used, but the quantity varies according to the condition of the meat. Freshly cooked or canned meat requires less sauce than dry meat. The dark meat of chicken requires less moistening than the white.

Chop the meat fine, but do not mash it to a pulp. Add seasonings and enough sauce to moisten well, having it just firm enough to mold. Chill on a flat dish. Mold two tablespoonfuls at a time into balls, cylinders, cubes, or pear shapes. With a broad-bladed knife lift the croquettes and dip into

fine white bread crumbs, then into egg (one egg beaten with two tablespoonfuls of water) and again into crumbs. Brush off any excess crumbs, lay the croquettes in a long handled wire basket, and immerse in deep fat until a golden brown color is secured. Drain on paper and serve. Cook only a few at a time so that the fat will not be cooled.

* Sautéd Potatoes

Sautéing (so-ta'ing) or cooking in a little fat, is frequently called frying. This is an incorrect use of the term, however, as *frying* means immersing in fat.

Melt three tablespoonfuls of fat in a frying pan, add one cup of cold, cooked potatoes finely chopped; sprinkle with salt. Mix the potatoes and fat well and cook for three minutes, stirring all the time. Then place where the bottom will brown. When well browned fold as you would an omelet and serve on a warm dish.

QUESTIONS AND PROBLEMS

What is meant by fried foods? What fats are best for frying? Why put fat for frying in a cold pan? Give test for temperature for frying uncooked foods. For cooked foods. In which is the fat hotter? Why are fish and oysters cooked in very hot fat? Tell how potatoes are fried. Tell how to prepare croquettes for frying. Why drain fried foods on paper? What is the difference between frying and sautéing? Which method is to be preferred? Why? How should fat that has been used for frying be treated? How may dark fat be clarified? Is fat that has been repeatedly reheated suitable for food? Give three reasons for the indigestibility of fried foods. Is frying a cheap way of cooking?

PASTRY

Pastry or pie crust is very indigestible as each little starch grain in the flour is coated with fat that keeps the digestive juices from acting on it. It is also very rich, and unless it is eaten following a light meal adds more fat than the body requires. Fat is used in pastry to make it tender.

In mixing pastry great care is needed to keep all the ingredients very cold. If warm, its particles stick together, little air can be folded in, and the paste will not be light. Little or no baking powder or other leavening is used, and the lightness depends on the expansion of the air in the dough. Good pastry results from very careful handling of the ingredients.

*** Plain Paste**

(Two crusts for small pie, about eight inches in diameter)

1 c. flour	¼ tsp. salt
⅛ tsp. baking powder	¼ c. shortening
about ¼ c. cold water	

Mix as directed for biscuit, using just enough water to make a dough that is neither sticky on account of too much water nor crumbly on account of too little. It should leave the bowl in a mass. Chill well, toss, half at a time, on to a slightly floured board until well coated with flour, then roll lightly from the center, keeping it circular in shape.

A More Elaborate Paste

(For one pie)

1 c. pastry flour	⅛ tsp. salt
2½ tsp. lard	2½ tsp. butter

Use enough ice water to make a stiff dough.

Chill all ingredients. Put the butter in a bowl, cover with ice water, and wash well with a wooden paddle. Drain off the water and press the butter with the paddle until quite dry and waxy.

Cut the lard into the flour as for biscuit dough. When it is granular add ice water, turn the paste on a lightly floured board, and pat and roll it into an oblong about one-fourth inch thick. Pat the butter into a cake one-half an inch thick and lay it on the half of a sheet of pastry that is nearest. Fold the upper half of the sheet over the butter and press the edges together. Fold the right edge of the sheet over two-thirds of the distance and the left third under, making three layers when finished. Now turn the sheet half way around, lift the paste, and dredge the board with flour as needed. Pat and roll, being careful not to press too hard or the paste will break and let out the air that has been folded in. Fold again as at first, and pat and roll to a thin sheet from one-fourth to one-eighth inch. If paste gets soft, place it in a pan on ice to chill.

Shortening for Paste. Lard may be used in combination with butter or oleomargarine for pastry. Lard and certain other cooking fats may also be used alone for this purpose.

Making a Pie. Use a perforated pie tin so that the bottom crust will be well cooked. Crust that is not thoroughly done will not be palatable. After the paste is folded and rolled for the last time cut off just enough for one pie.

Roll it a little larger than the pan into which it is to be placed, as it shrinks in baking. When lining the pan be sure there is no air left under the crust. A pie with only one crust is more digestible than one with two crusts.

For the upper crust allow a little more paste than for the lower. A juicy pie requires a rim to keep it from running over. Cut a thin piece of paste three-fourths of an inch wide. Moisten the top of the pie and lay the rim over it, full, not stretched tight. A pastry jigger makes a fluted rim. For mince pies a rim is put between the crusts. Moisten the top of the rim before putting on the crust, and prick the top crust with a fork so that the steam can find a way out.

For cooked fruit bake the crust first, then put in the fruit. Prick the crust with a fork before baking so that it will be smooth.

Bake pies in a moderately hot oven. Always have the bottom of the oven hotter than the top. Cook fruit pies from thirty to forty-five minutes, custard pies until the filling is set. They should be put into a hot oven so that the bottom crust will be cooked before it becomes too sticky. If necessary cover the top. Lower the heat after the first ten or fifteen minutes. The pie must not boil.

*** Apple Pie (Class Recipe)**

2 medium-sized tart apples
1 tsp. butter
4 tbsp. sugar
sprinkling of nutmeg or cinnamon

Make one cup of flour into paste, according to recipe. Line a small pie tin, and put on a rim. Pare, core, and slice the apples. Put them in the paste, heaping the apples twice the depth of the pan. Sprinkle with sugar. Put the butter on in tiny bits; then lay on the top crust. Press the edges together with a fork. Cut several small gashes to let out the steam, and bake as directed.

Cheese Straws

1 c. flour
⅛ tsp. cayenne
¼ c. butter
½ c. grated cheese
¼ tsp. salt
ice water

Mix and sift the dry ingredients and proceed as for pastry, folding in half the cheese as the butter is folded in. Then fold in the remainder and finally fold a third time. Roll into a sheet one-fourth inch thick and cut into strips four inches long and one-fourth inch wide. Bake in a moderate oven for eight minutes, lowering the heat if the strips are in danger of burning.

QUESTIONS AND PROBLEMS

What can be said of the digestibility of pastry? Does the making of pastry use much of the housekeeper's time? What kind of fat is used for pastry? Is pie a cheap dessert? Compute the cost of an apple pie including fuel. Which is better for your health, pie or fresh raw apples? Which costs the more? Tell how pastry is made. Why is it important to have all ingredients cold? Why does pastry become light? How should the oven be heated for baking pastry?

EMULSIFICATION OF FATS

Fats may be combined with liquids by a process that is known as emulsification; that is, by beating, the particles of fat are mixed with the liquid. Fats do not dissolve in liquids, as sugar does; instead, small particles of the fat mix with the liquid by being suspended in it. For example, in milk, the butterfat, or cream, is suspended in the liquid in the form of very small particles. Milk is therefore known as an *emulsion*. When the milk is kept for a time the fat separates and rises to the top. A separation like this sometimes takes place in gravies and salad dressings if they are not carefully made.

Salad Oils. Pure olive oil is the best oil for salads. Buy from a reliable firm, as cottonseed oil and peanut oil are sometimes mixed with it. Adulteration can usually be detected by taste and odor. Peanut oil, for example, has an odor like beans; cottonseed oil, especially when heated, can be easily recognized; good olive oil has a bland, pleasant taste and an odor that is distinct from any other oil. The finest olive oil is a pale green in color. Some varieties are very light; others are a golden yellow. Get from a reliable druggist a sample of strictly pure oil and become familiar with the odor and taste. This will be a guide in selecting oil. Some of the compound salad oils are probably not unhealthful but one does not wish to pay olive oil prices for

them. Cottonseed oil, much used in these compounds, is very cheap and is the best substitute for olive oil.

*** French Dressing (Class Recipe ¼)**

6 tbsp. olive oil or other oil	a pinch of paprika or
2 tbsp. vinegar or	cayenne
1½ tbsp. lemon juice	½ tsp. salt

Have the oil very cold. Put the salt, pepper, and oil into a cold bowl and beat all together until well mixed. Then add the acid, a few drops at a time, beating constantly and briskly until well mixed. Serve with salads of green vegetables or acid fruits. Make French Dressing shortly before using.

*** Mayonnaise (Mā'ŏ-nāz')**

(Pupils work in groups of four or six)

1 egg yolk	½ c. olive oil or other salad oil
½ tsp. salt	½ tbsp. lemon juice
½ tsp. vinegar	⅛ tsp. paprika

Have all the ingredients very cold. If the weather is warm, put a small bowl into a pan of ice and salt. Put in the dry ingredients, beat in the egg, and then add oil, a drop at a time, beating briskly. When too stiff to beat add a few drops of acid alternately with the oil. When done, the dressing should be stiff enough to hold its shape. Keep on ice, closely covered, until ready to serve. If the dressing curdles beat it very gradually into another egg yolk. Serve with acid fruit, and vegetable and meat salads. All the acid may be added first, then the oil one teaspoonful at a time.

QUESTIONS AND PROBLEMS

What is meant by an emulsion? Give examples. What are the important points in making salad dressing? Describe the making of Mayonnaise. Mention some salads on which Mayonnaise may be used.

NUTS

Most nuts may be classed with fats. The chestnut should be considered as a carbohydrate; as it is largely starch, it requires cooking to be digestible. The peanut also contains much starch as well as a high percentage of fat, and should therefore be cooked. It is a legume, not a nut, but is classed with nuts on account

of its fat. All nuts have much woody fiber, therefore, unless chewed very carefully, they will be indigestible.

Rancid Nuts. Nuts, like other fats, grow rancid in a warm place or in warm weather. Keep them in a cool place. Any rancid fat causes indigestion.

*** Peanut Butter**

½ c. good roasted peanuts	1 tbsp. butter
⅛ to ¼ tsp. salt	1 tbsp. water boiled and cooled

Buy freshly roasted peanuts or roast them carefully in a moderate oven, being careful not to burn them. Shell the nuts, rub off the brown skin with a cloth, pouring the nuts from bowl to bowl in the air so that the skin will blow off. Grind through a meat chopper, using the finest cutter. Rub to a paste in a mortar if possible. After rubbing in the butter, salt, and water, pack in small glasses. Cover with oiled paper and keep in a cold place. Peanut butter should be made in small quantities and used while fresh. If it is to be used immediately moisten the butter with cream.

Blanching Almonds. Almonds are rich in protein and have a high per cent of fat. They may therefore be used as a meat substitute.

In order to remove the brown skin, cover the shelled nuts with boiling water for two minutes. Drain. Pour cold water over them and rub until the skins are loosened. Lift from the water with a skimmer and dry on a towel, taking off any bits of skin that remain.

Shredded almonds are used for sprinkling over cakes, ice cream, and salads. Cut the blanched almonds in thin shreds lengthwise.

QUESTIONS AND PROBLEMS

Why do nuts require careful chewing? Why should chestnuts be cooked? Peanuts? How should nuts be kept? Compare the cost and food value of a pound of peanuts and one of butter. Compare in like manner almonds, pecans, walnuts, and butter. Make a menu containing nuts. Would you use nuts with foods rich in fat?

Supplementary Recipes

Doughnuts (p. 363) Pumpkin Pie (p. 373)
Sweet Potato Pie (p. 373)

CHAPTER XVI

SUGAR

COMPOSITION OF SUGARS

	WATER	PROTEIN	FAT	CARBOHYDRATE	ASH	CALORIES PER POUND
Granulated Sugar	....	...	...	100	...	1860
Maple Sugar	16.3	...	...	82.8	.9	1540
Honey	18.2	.4	...	81.2	.2	1520
Sugar-house Molasses	25.1	2.4	...	69.3	3.2	1290
Stick Candy	3	...	...	96.5	.5	1785

Sugar is made from the juice of the sugar cane and the sugar beet. A little is manufactured from the sap of the maple tree. Honey is a kind of sugar and was used for cakes and preserves before cane sugar became known. Glucose is a sugar found in fruits, but it is also made from cornstarch heated with an acid. (See Experiment V, page 44.) It is not so sweet but is cheaper than cane sugar, and is sometimes used as an adulterant. Lactose, or milk sugar, made from milk, is used for infants and in medicines. Maltose, or malt sugar, is made from sprouting seed.

In this text the term "cane sugar" is used to include both cane and beet sugar as they are alike in composition and can not be distinguished from each other by general appearance or taste.

Saccharin is a mineral substance many times sweeter than sugar. It is not a food and is injurious to health. It is used as an adulterant in jellies, canned fruits, syrups, and soft drinks.

Pure molasses is made of the cane juice that does not crystallize in the process of sugar making. Sorghum is a syrup made by boiling the juice of sorghum cane. It is used alone or in compound syrup with glucose. Corn syrup is four-fifths glucose and one-fifth cane syrup.

EXPERIMENT I. Take any acid juice, such as apple, grape, or berry. Divide it into three portions and sweeten the first one to taste, using granulated sugar; add the same quantity of sugar to the second portion and cook for five minutes; add the same quantity of crystallized glucose to the third portion; taste each and see which is the sweetest. Why do we sweeten acid fruits at the end of the cooking period? Which is sweeter, cane sugar or glucose. What is the price per pound of each?

Review tests for Grape Sugar, Experiment II, page 44, for Cane Sugar, Experiment IV, page 44, and for changing starch to sugar, Experiment V, page 44. Exhibit samples of glucose and milk sugar to class.

Food Value. Sugar is an almost pure form of carbohydrate, having barely a trace of water. It yields eighteen hundred and sixty calories per pound and is a highly concentrated food, but unless it is very much diluted when eaten it may irritate the lining of the stomach. A diet too rich in sugar disturbs the digestion, overburdens the liver, and often causes a very yellow skin. Do not eat sweets between meals, but take a small allowance for dessert occasionally. Sugar is very fattening, and it has been estimated that if a person eats one lump of sugar per day in excess of what his body can properly utilize he will gain forty pounds in weight in ten years. Children should not eat much sugar. It does not build bone and muscle and will destroy their appetite for tissue-building foods.

EXPERIMENT II. Add enough cold water to one-fourth cup of sugar to dissolve it; note the amount required.

EXPERIMENT III. Repeat Experiment II, using hot water.

EXPERIMENT IV. Mix solutions from Experiments II and III. Add one tablespoonful of water and boil until thick enough for a table syrup. Bottle and let stand for several days. What is the result? Sugar syrups crystallize; rock candy is made of a heavy syrup turned into pans in which threads are stretched, the crystals forming on the threads.

Syrup for frostings and candies should not be stirred while cooking, as crystals will form. Glucose and acids prevent crystallization. Cane sugar when heated with an acid is partly changed to glucose which does not form large crystals. (See Experiments I, II, III, and IV, pages 43, 44.) To what candies are acids added? What acids are used? We seldom use glucose in the pure form. Corn syrup, however, which is largely glucose, is added in making some candies.

CANDY

Some candies are almost as rich in sugar as granulated sugar is; others contain more water and also starch and flour. As candy is a concentrated food it disturbs the digestion if eaten in quantity. A small portion, however, taken at the end of a meal is allowable. Home-made candy is usually of better quality than the commercial article and is also cheaper.

In making any cooked candy except barley sugar, or caramelized sugar candy one must be able to tell when the sugar is cooked enough. Sugar is cooked with water or other liquid, and whenever enough water is cooked out the sugar crystallizes or granulates. If more than the given quantity of liquid is used in fudge, will it need longer cooking? Why? Candies are often spoiled by too much cooking, but if cooked too little they will not be firm.

TEMPERATURES FOR COOKING SUGAR

Small thread	215° F.	Soft crack	290° F.
Long thread	217° F.	Hard crack	310° F.
Soft ball	238° F.	Caramel	350° F.
Hard ball	248° F.		

Barley Sugar (Class Recipe)

¼ c. sugar

Butter a plate before putting the sugar over the fire. Put the sugar into a small frying pan. Stir over a very moderate heat until melted and turn into the greased platter. This is a candy known as barley sugar.

* Peanut Brittle (Class Recipe)

¼ c. sugar 2 tbsp. chopped peanuts

Rub the brown skin from roasted peanuts and chop. Melt the sugar as above. Add the peanuts and turn into a greased platter. Then mark in squares. Or, add one-fourth cup water to sugar, cook to a light straw color, and proceed as above.

* Caramel Syrup (Class Recipe)

½ c. sugar ½ c. boiling water

Proceed as for barley sugar. Stir constantly until a golden brown color is secured and add the boiling water. As the sugar is much hotter than the boiling water there will be a great deal of steam. Do not hold face near the pan. Stir over the fire until the caramel is dissolved and cook until it reaches the thickness of table syrup. Put the syrup in a small jar and use it as a flavoring for pudding sauces.

Where a brown color is desired with less sweetening power, cook the sugar to a rich brown before adding the water.

Sugar heated until it browns is said to be caramelized.

*Fudge (Class Recipe ¼)

2 c. sugar
4 tbsp. cream
1 tbsp. vanilla
1 square bitter chocolate
¾ c. milk

In making fudge the syrup is cooked to the soft ball stage; that is, until a little of the syrup dropped in ice water forms a soft ball (test temperature) that just holds its shape when taken between the fingers. Be careful to see that it makes a ball rather than a sticky mass when taken up. If it makes a hard ball it is cooked too much.

Cook the chocolate, sugar, and milk in a smooth saucepan to the soft ball stage, stirring until it dissolves. Beat until it becomes creamy. Add cream and vanilla a little at a time, beating well. Pour into a buttered pan and cut into squares. Add one cup of chopped nuts if desired.

Fondant (Class Recipe ¼)

2 c. sugar
½ c. water
¼ tsp. cream tartar

Mix sugar and cream of tartar in a smooth saucepan. Add water and stir over the fire until dissolved. Wipe the sides of the pan clean with a damp piece of cheesecloth wrapped around a fork. Cook until it reaches the soft ball stage. Cover at first so that the steam will keep down the crystals. (See Fudge.) Test after the first ten minutes. Keep the sides of the pan free from crystals. Why? Then set the pan down gently until it is almost cool. The center should be barely warm, but it should not be hard around the edge. Beat with a spoon until it is creamy and begins to crumble. Then knead with the hands to a creamy, smooth mass. Place in a bowl, cover with oiled paper, and put in a cool place over night. The fondant may be used for cream mints, chocolate creams, and other candies.

Cream Mints

1 c. fondant
6 drops oil of peppermint

Melt the fondant in a smooth saucepan over hot water, [illegible] peppermint; then drop from the tip of a teaspoon on oiled paper, making the drops the size of a quarter. If colored mints are desired add a little pink or green coloring to the melted fondant. The tints must be delicate. Most colors are made from minerals and are injurious, so it is best to use uncolored candies.

Nut Creams

It is well to buy a few creams from a reliable confectioner for models. Mold the creams and keep cool until firm, dip in fondant (melted over hot water) colored and flavored as desired, and lay half a pecan or walnut meat on each.

Chocolate Creams (Class Recipe ¼)

Mold a little smaller than for nut creams, as the coating will be much heavier. When firm dip in chocolate.

Chocolate for Dipping

Add two squares of chocolate and one teaspoonful of vanilla to one cup of fondant. Melt over hot water until it is smooth. Remove from the fire, but keep in hot water. Drop a cream into the fondant, lift out quickly with a two-tined fork, and lay on oiled paper. Work quickly, as the cream thickens. The candy may be reheated and thinned with a few drops of hot water. When the chocolate begins to granulate, stir well, heat until soft, and turn into a small platter. It may be used like fudge.

CAKE FROSTINGS

Cake frostings are usually made with a heavy syrup for a basis, although they may be made of uncooked sugar. They add to the appearance of a cake but may make it indigestible because of the excess of sugar. Success with cooked frostings depends on skill in cooking the sugar. Success in uncooked frostings depends upon the manner of beating and the condition of the sugar used.

* Plain Cooked Frosting

(Class Recipe for Group of Four)

1 c. sugar
½ tsp. flavoring
⅓ c. water
1 egg-white, well beaten

Boil sugar and water as directed for fondant until it spins a fine thread when dropped from the tip of the spoon. Pour it gradually over the egg, beating constantly. Add the flavoring and beat until stiff. Then spread on the cake. If the frosting must wait for the cake, set the bowl in a pan of hot water.

Ornamental Frosting

2 c. sugar
3 egg-whites, well beaten
½ c. water
¼ tsp. cream of tartar

Proceed as for plain frosting, cooking until it spins a long thread from the spoon. When thick enough to spread on the cake put on a thin coat and when it hardens slightly put on another. Beat the remainder until very stiff, so that it will hold its shape. Then turn into a pastry bag and decorate the cake as desired. Elaborate cakes are not in good taste.

* Plain Chocolate Frosting

1 c. sugar
½ c. water
2 squares chocolate
1 tsp. butter
1 tsp. vanilla

Place all ingredients except flavoring in a saucepan over a low heat and stir until melted. Boil for twenty minutes. Remove from the fire and beat until cool. Add flavoring and spread on cake while still warm enough to glaze nicely. Add a few drops of hot water if too thick.

* Uncooked Frosting No. 2

1 tbsp. milk or cream
¼ tsp. flavoring
½ c. powdered sugar

Roll and sift the sugar. Stir it into the liquid until thick enough to spread. Put frosting on the cake with a wet knife.

* Uncooked Frosting No. 2

3 egg-whites
confectioners' sugar
1 tbsp. lemon juice

Sift the sugar. Put the eggs (unbeaten) into a bowl. Add three tablespoonfuls of sugar, and beat for five minutes. Add three more tablespoonfuls of sugar and beat it in well. Continue adding sugar in this way until

the frosting is quite thick. Then add one teaspoonful of lemon juice. Add more sugar and lemon juice. When all the lemon juice is used and the frosting is stiff enough to spread put it on the cake. Beat more sugar into the remainder of the frosting until it will hold its shape, then put through the pastry tube, and decorate the cake as desired.

QUESTIONS AND PROBLEMS

From what is the glucose that is used in syrups and candies made? What effect has too much sugar on health? Describe the thread test for sugar; the soft ball; the caramel. Give some recipes in which they are used. How does the quantity of sugar used affect candy? Why is acid used? What acids may be used? Why not stir or shake fondant? Why is cream of tartar used? What could be substituted for it? If you should make a mistake and add one cup of water when the recipe calls for one-half cup would the candy be spoiled? Give reason for your answer

Supplementary Recipes

Pulling Candy (p. 355)
Fruits Glacé (p. 356)
Nuts Glacé (p. 356)
Divinity (p. 356)
Caramel Frosting (p. 366)
Orange Frosting (p. 366)
Chocolate Frosting (p. 366)
Fudge Frosting (p. 366)
*Mocha Frosting (p. 366)

CHAPTER XVII

CAKES AND CAKE MAKING

A good cake must be tender and melting. Cakes contain eggs, and if the egg is overheated the cake is tough and dry.

Cake is hard to digest because in it ingredients are combined that should be cooked at different temperatures. Those that contain butter are apt to disturb the digestion on account of the coating of fat that covers the starch grains of the flour. Sponge cake and angel cake contain overcooked egg, or, if the egg is properly cooked, the flour is not done. Cake should be used in moderation and eaten very slowly.

Cake Flour. A good cake flour holds its shape when pressed in the hand and is velvety to the touch. Bread flour does not make such good cake because of the gluten it contains. If bread flour is used in a recipe that calls for pastry flour, use only seven-eighths of the given quantity. The recipes in this book are based on a high grade flour which makes good biscuits. A good biscuit flour is not so rich in gluten as bread flour. In substituting pastry flour for it, use one-sixteenth more.

Other Ingredients. If sugar is coarse, roll and sift, for coarse sugar will give a hard crust and a poor texture. Eggs must be fresh; if old the albumin cells are broken and air cannot be beaten into the white. Use only the best flavorings and baking powder.

LEAVENING AGENTS IN CAKES

Cakes are made light by carbon dioxide gas (From what is this gas obtained?), by air, and by steam, just as muffins and breads are lightened. Eggs are used to give additional lightness as they form a film to hold the gas and air bubbles. Much air can be beaten into egg, particularly into the white. Baking powder and other leavening agents are used with egg in most butter cakes. In sponge cake and angel cake the lightness de-

pends on the air beaten into them. If the number of eggs is lessened, as in hot water sponge cake, baking powder is added.

Proportion of Principal Ingredients. In cake as in biscuit, muffins, and yeast bread there is a general proportion of liquid to flour, and of sugar to flour. Fat becomes liquid when melted, so in cakes rich in fat (the old-fashioned pound cake is an example) no other liquid is used. If the fat is increased more flour must be used, or the milk or water, if either is used, must be lessened, as the batter must be thicker. When egg yolks are substituted for the whole egg the quantity of fat added is lessened because egg yolk is rich in fat. (See Yellow Cake, page 352.) Egg seems to be a liquid when uncooked but acts partly as a thickening when heated. Therefore, if egg is used as the liquid element instead of fat or other liquid, less flour is required. Sponge cake and angel cake are examples.

Order of Work. (1) Get out all the necessary utensils. Light the fire, if wood or coal is used.

(2) Prepare the materials. Roll sugar, if necessary; measure and sift dry ingredients, then measure fats and liquids.

(3) Prepare the pans. Thin aluminum cake pans are the most satisfactory. Have the pan very clean and smooth. Brush with a little sweet melted fat on a brush or a soft paper. If a smooth surface for frosting is desired dredge the pan with flour, then invert and strike sharply on the table to remove the loose flour. If there is danger that the cake will stick or that bottom and sides will cook too fast, line the pan smoothly with thin white paper and then grease the paper.

(4) Mix the cake and have the oven ready just as the cake is finished. If using a gas stove, light the gas in time for the oven to be heated to the temperature desired.

Baking Cup and Layer Cakes. Heat a gas oven with both burners for ten minutes or until it is moderately hot. Put in the cakes. Close the oven door and turn off both burners for eight minutes. Then light both burners and turn on half way, leaving on for fifteen minutes. Watch the cake carefully and if there is danger of its burning lower the heat. Test the cake when it seems done; the exact time needed depends on the range. After the cake begins to rise do not move it until it becomes firm, as it will fall if moved.

In a coal or wood stove start the fire in time to have the oven moderately hot when the cakes are put in. After they are in take off the top lids and turn the damper so that the oven will not be heated any more for five minutes. Then put on the lids and let the heat increase; it must never be as intense as for biscuit. If the oven cooks the top of the cake too fast put a pan of water on the top shelf in the oven for the first ten minutes. If the bottom is too hot cover it with an asbestos mat. If the oven is too hot the cake will brown before it can rise, and will burst through the center and form a peak; if not hot enough, the cake will not rise well or will fall before the baking is finished.

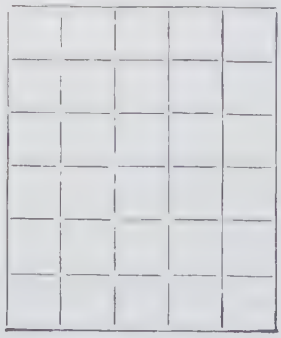
Divide the time for cake baking into quarters. During the first quarter the cake rises, but does not brown; during the second quarter it continues to rise and browns in specks; in the third quarter browning continues, and it is finished during the fourth quarter when the cake shrinks slightly from the pan.

Testing the Cake. Lift the pan and see if there is a singing sound. If there is, the cake has not cooked long enough. Test with a wooden toothpick in the thickest part; if it comes out clear, the cake has been sufficiently baked. Cake when done shrinks from the pan and comes quickly back into place if presssed gently with the tip of the finger. Cup cakes should be turned on to a platter to cool and should be served fresh.

Score the various cakes made, in the following table:

SCORE CARD FOR CAKE	
General appearance—size, shape, icing, etc.	10
Lightness	15
Crust—color, depth, and texture,	10
Crumb—moisture, color, grain, and texture	20
Flavor of cake itself	35
Flavor of cake, including icing and filling	10
Total	100

STUDENT'S SCORE



* Cocoa Tea Cakes (Class Recipe)

(For older pupils review Experiments IV, VII, VIII, XI, XII, and XIII, pages 196-198. Also review muffins and measurements.)

9 tbsp. flour
⅔ tsp. baking powder
1⅓ tbsp. cocoa
3 tbsp. milk
⅓ c. sugar
1¾ tbsp. lard or other cooking fat
1 egg
⅛ tsp. salt

Prepare the pans as for muffins. Sift flour, baking powder, cocoa, and salt together. Cream the fat (it may be warmed if very firm) until soft. Add sugar gradually and cream until very smooth. Break the egg into a cup, add it to the creamed fat and sugar, and beat very thoroughly. When light and smooth add a little milk, then a little of the flour mixture, keeping the dough thick. Add flour and milk alternately until all are used. Stir as little as possible, as *too much stirring makes the cake tough.* Fill the muffin pans a little less than two-thirds full; if filled too full the cake will run over. Bake as directed for Cup Cakes, below.

* Soft Ginger Bread (Class Recipe ⅛)

(Review Muffins. Compare recipes, How do they differ?)

1 c. sugar
3½ c. flour
1 tsp. cinnamon
½ tsp. salt if lard is used
1 c. sour milk
3 eggs
¾ c. lard or butter
1 tsp. soda
3 tsp. ginger
1 c. raisins
1 c. sugar-house molasses

Proceed as for cocoa tea cakes, adding molasses alternately with milk. Add raisins last. They should be cut and well dredged with flour. Spread the cake one inch thick in a biscuit pan and bake as directed for layer cake for thirty minutes or more. Test as for other cakes. Do not have the oven too hot, as cakes with molasses burn easily. If preferred, the cake may be baked in muffin pans. If sweet milk instead of sour milk is used omit one-half teaspoonful of soda and add two teaspoonfuls of baking powder.

* Cup Cakes (Class Recipe ¼)

(Review beating eggs)

3 c. flour
3 tsp. baking powder
1 c. milk
2 c. sugar
½ to ¾ c. butter
4 eggs
1 tsp. flavoring

Wash butter if very salt. Prepare dry ingredients. Cream butter and sugar as in cocoa tea cakes. Add to it the egg yolks, beaten with a dover egg beater until thick and lemon colored. Add milk and sugar as in cocoa tea cakes. Then fold in the egg-whites which have been beaten stiff with a whisk egg beater. Bake as directed for cocoa tea cakes in muffin pans.

Layer Cakes

Turn the cup cake mixture into two ten-inch layer cake pans (two thick layers are sufficient) that are from one and one-half to two inches deep. Spread the cake in the pan with a spatula, leaving a slight depression in the center, and bake as directed for cocoa tea cakes. Turn cakes out on a platter and when slightly cool spread one layer with filling, and lay the other over it with the right side up. This cake is very nice with orange or pineapple filling. These fillings must be used the day they are made. If a small cake is desired make only one layer, cut it in half horizontally, and put together with filling.

Fruit Layer. For a fruit layer add to one-half the cake mixture 1 tbsp. molasses; ½ c. raisins, which have been stoned, cut fine, and floured with one and one-third tablespoonfuls of flour; 1 tbsp. of shredded citron; 1½ tsp. of cinnamon; ¾ tsp. allspice; ¾ tsp. cloves. Put a light and a dark mixture together with one of the chocolate fillings.

Cake Fillings

Orange Filling. ½ c. sugar; 2½ tbsp. flour; ¼ c. orange juice; grated rind of ½ orange (yellow part only); 2 tsp. lemon juice; 1 tsp. butter. Mix the sugar and flour. Add the fruit juice, the slightly beaten egg, and the orange peel. Cook over hot (not boiling) water for ten minutes, stirring constantly. Cool and spread on the cake.

Pineapple Filling. Drain 1 c. grated pineapple in a sieve. Cook the juice and ½ c. sugar to a thick syrup. Add the pineapple and spread between the layers of the cake. If a large quantity of filling is desired bring the juice to the boiling point and thicken with a little cornstarch, adding it to the sugar. Do not cook very long.

Caramel Filling. See Caramel Frosting, page 366. Add nuts if desired.

Chocolate Filling. See Chocolate Frosting, page 240. Add nuts if desired.

Jelly Filling. A tart jelly makes a very good filling.

Loaf Cake

Bake the cup cake mixture in a loaf according to the following directions:

For a cake made with butter or other fat, heat the gas oven for five minutes with one burner. Put a pan of hot water on the bottom and put the cake on the middle shelf of the oven. Turn the burner down half way for thirty minutes; then turn to full force for twenty minutes. Remove the water ten or fifteen minutes before the cake is done, according to the temperature of the oven. If the top browns quickly lay a stiff paper over it for a while. The gas burners must be regulated according to the gas pressure. With a low pressure both burners may be used.

Bake a thin loaf cake for forty minutes, increasing the heat after the first twenty minutes. Bake a thick cake at least an hour. Loaf cake requires a slower oven than layer cake because it is so thick that a crust will form before it rises. When using a wood or coal stove, proceed as above, regulating the heat according to the directions for cup and layer cakes.

Cream Puffs (Class Recipe ½)

½ c. hot water	¼ c. butter
⅔ c. flour	2 eggs

Add the butter to the water and bring to the boiling point. Then turn the flour in all at once. Stir very briskly until a smooth paste is formed. Cook over a low fire for three minutes, stirring continually. Cool. Then add the unbeaten eggs, one at a time, beating after each one is added until the paste is perfectly smooth. When all the eggs are in, drop batter from the tip of a tablespoon on to a very cold baking sheet or a biscuit pan that has been well greased. Leave a space between each puff to allow for expansion. Bake for thirty or forty minutes in a moderately hot oven. When done the puffs should be light, dry shells. If the oven is too cold the egg will cook too much before the batter puffs; if too hot the egg will brown too much and a very disagreeable flavor will develop. If there is danger of burning, the heat may be reduced after the cakes puff well.

When puffs are cold open them at the side and fill with the cream given below. Barely moisten the top with beaten egg-white and dust with powdered sugar. Serve the day they are cooked, as custards and other egg mixtures may develop ptomaines if kept too long.

Cream for Filling (Class Recipe ½)

1 c. scalded milk	¼ c. flour
1 egg	6 tbsp. sugar
1 tbsp. butter	6 drops vanilla

Make a white sauce of the milk and flour and cook for fifteen minutes, stirring frequently. Beat the egg and sugar together. Add the hot paste gradually to it. Return to the boiler and stir until the egg thickens. Add the butter and, when cool, the vanilla. Then fill the puffs.

QUESTIONS AND PROBLEMS

What difference is there in the beating of eggs for sponge and angel cakes and for cream puffs? What is the texture of the sponge cake? Why is the shell of the cream puff not easy to digest? Why is the filling cooked in the double boiler?

Drop Cookies

1⅓ c. flour	⅓ c. milk
1¼ tsp. baking powder	⅔ c. sugar
1 tsp. flavoring	¼ c butter
1 egg	

Mix as directed for cocoa tea cakes. Drop a teaspoonful of batter in the center of a three-inch space. Bake in a moderately quick oven till a rich brown.

* Shakespeare Cookies (Class Recipe ½ for Group of Six)

Flour to make a soft dough	1 c sour milk
. (6 to 8 c.)	2 c. sugar
1 tsp. soda	1 tbsp. vanilla
1 egg	½ or ¾ c. lard

Proceed as for cocoa tea cakes. Sift the soda with three cups of flour Add the milk and flour alternately. Then add enough more flour to make a soft dough that can be rolled easily. Chill and then toss on a lightly floured board until well coated with flour to prevent sticking. Roll to a paper thickness and cut with a two and one-half inch biscuit cutter. (Lift dough from board occasionally while rolling.) Bake in an oven slightly cooler than for biscuit until a delicate brown is secured. Cookies contain sugar so they burn easily. If thick cookies are preferred to thin ones the dough may be rolled to one-fourth inch thickness.

Vanilla Cookies. Omit the flavoring and spray the cookies after they are baked with vanilla extract from a perfumery atomizer.

Sugar Cookies. Sift a little sugar over the dough before cutting. Pass the rolling-pin lightly over it and cut with a large cutter.

Spice Cookies. Divide the cooky dough into four parts after the three cups of flour are added. To one part add a tablespoonful of mixed spices Then finish as directed. (Mixed Spices: ½ tsp. cloves; ½ tsp. allspice; 1 tsp. mace; 1 tsp. nutmeg; 3 tsp. cinnamon. Sift together well and keep in a tightly corked bottle.)

Chocolate Cookies. To one-fourth of the dough add 2 tbsp. of powdered cocoa. Finish as directed for spice cookies.

Cocoanut Cookies. To one-fourth the dough add ½ c. fresh grated cocoanut. Finish as above. Finish remainder of dough as you would Shakespeare, vanilla, or sugar cookies.

CAKES WITHOUT BUTTER

In making these cakes the two important points are: to mix carefully so that sufficient air will be folded in to make them light, and to bake slowly and thoroughly. If carelessly made they will not rise well, and if baked in too quick an oven they will shrink. If taken out too soon the egg will shrivel and the cakes will fall.

Baking Angel and Sponge Cakes. If a gas oven is used heat it with one burner for five minutes before putting in the cake. Put a pan of hot water on the lower shelf. Put the cake in the oven and turn the burner to one-third its force. Do not open the oven door for twenty minutes. Inspect the cake. If it is well risen (as it should be) turn the burner to full force and bake for thirty minutes. Take out the water five minutes before the cake is done. Test it by pressing gently with the finger. It should come back into place. Sponge and angel cakes shrink from the pan when done. If overcooked, they will be dry; if undercooked, moist and pasty. Invert the pan for a few moments and the cake will come out easily. To slice angel or sponge cake, use two silver forks, gently pulling the cake apart into suitable servings.

*Hot Water Sponge Cake (Class Recipe ½)

1 c. flour	1 c. sugar
1½ tsp. baking powder	⅛ tsp. salt
6 tbsp. hot water	the grated peel of ½ lemon (yellow part only)
2 eggs	

Roll and sift the sugar four times. Sift flour, salt, and baking powder together four times. Beat the egg yolks until thick and lemon colored. Add sugar. Beat well and then add flour and hot water alternately. Fold in the whites of eggs and bake in muffin pans as directed for cocoa tea cakes, or bake in two layers.

Jelly Roll

Use the recipe above. Turn into a shallow oblong tin about eight by ten inches and bake for about fifteen minutes according to directions for layer cake. When done turn on to a board covered with a clean cloth, and with the point of a sharp knife cut off the crust at the sides. Spread with a tart jelly and roll immediately, using the cloth to hold it. Do not mash the roll. Dust with powdered sugar and serve while fresh.

Sponge Cake

1 c. sugar
$\frac{1}{4}$ tsp. salt
1 tsp. lemon juice
1c. flour
6 eggs
grated rind of half a lemon (yellow part only)

Sift the flour six times. Sift the sugar. Measure and roll. Then sift six times, discarding the coarse grains. Beat the eggs until thick and lemon colored. Beat in the sugar and salt, and the lemon juice and peel. Fold in the whites of eggs. Sprinkle half the flour over the cake and fold it in very carefully (See Cutting and Folding Eggs, page 131). Then fold in the remainder of the flour. Turn into a long, narrow, lightly greased pan. Have the dough almost as thick as you desire the cake to be when done. Spread in the pan as directed for layer cake.

QUESTIONS AND PROBLEMS

Why are cakes difficult to digest? If food is not well digested does the body get full benefit from it? What is the chief food element in cookies? What other elements are present? What is the food value of sponge cake? Which would increase the protein allowance more, cookies or sponge cake? Are cakes expensive? How often do you eat them?

Why is sugar rolled and sifted? Give directions for preparing cake pans. Tell how to beat the whites of eggs. How to cut and fold them in. (See page 131.)

Tell how to bake cup or layer cakes in a gas oven. In a coal or wood stove. What makes a cake coarse? What causes it to fall? What causes it to run over the edges of the pan? Give test for butter cakes. For sponge cakes. Why not let the water boil under the orange filling?

Give proportions of fat, sugar, flour, and milk in cup cake mixture. What change in this proportion was made when egg yolks only were used? (See Yellow Cake, page 352.) Compare methods of mixing cocoa tea cakes and cup cakes. What difference in texture did you observe? Compare the recipes for the sponge cake and the hot water sponge cake. Compare the cost of four eggs with the cost of one and one-half teaspoonfuls of baking powder.

Supplementary Recipes

Yellow Cake (p. 352)
White Loaf Cake (p. 352)
A Tender Loaf Cake (p. 353)
*Fruit Cake (p. 353)
A Cheap Fruit Cake (p. 354)
Angel Cake (p. 354)
Angel Cakelets (p. 354)
Meringues (p. 355)
Pecan Macaroons (p. 355)

CHAPTER XVIII

SIMPLE DESSERTS

A dessert is served at the end of the meal, and it should be selected according to the dishes that have been served during the meal. If a heavy dessert follows a rich meal one is tempted to eat more than he needs. Fruit, not too heavily sugared, is one of the safest desserts. Exceptions to this are bananas, which are rich in starch, and dried fruits which contain much sugar. (See Table, page 84.) Fruit furnishes the needed salts and acids.

A combination of canned or fresh fruits with a small quantity of sponge cake makes a pleasing dessert. Simple puddings containing milk and eggs may supplement a meal which contains a scanty supply of meat, as they furnish the additional protein needed. Desserts rich in starch and sugar, such as apple or tapioca puddings, cornstarch puddings, and Washington pie, should not be served at a meal where rice, potatoes, or dried beans are used, but should follow a meal containing meat and green vegetables. Desserts rich in fat, such as whipped cream in various forms, or pies, should not come at the end of a menu containing roast pork or other fat meats. Never combine acids with starches in a dessert. Desserts should be daintily served.

Sponge Cake with Fruit Juice

Cut stale sponge cake into rounds, moisten with strawberry juice, put a spoonful of whipped cream over each round, and serve. The juice of other fruits may be used.

Strawberry Juice. Warm three cups of well mashed berries very slowly, so that the juice will run easily. Crush through a sieve. Add three-fourths cup of sugar, and keep in a cool place until ready to serve.

* Peach Pudding

Dip the tops of rounds of sponge cake into melted butter. Lay two halves of a canned or fresh peach on each. Place a blanched almond in the center and pour a little sauce over all.

* Pudding Sauce No. 1

(Review Experiment VI, page 117)

1 c. juice from peaches
1 tbsp. cornstarch
1 small piece of orange peel
2 or 3 tbsp. sugar, according to acidity of juice

Bring the juice to the boiling point. Add to cornstarch mixed with sugar. Return to the saucepan and stir over a fire until it boils. Add orange peel. Cook for ten minutes and serve.

* Cottage Pudding

(Review Experiment VI, page 117)

Use Cup Cake recipe, allowing three-fourths the quantity of sugar. Serve with lemon sauce.

Lemon Sauce

½ c sugar
2 tbsp. butter
2 tbsp. lemon juice
1 c. boiling water
1½ tbsp. cornstarch
1 tbsp. cornstarch
a grating of nutmeg

Proceed as for Pudding Sauce No. 1. Cook for five minutes. Add butter and flavorings and serve.

* Cornstarch Pudding (Class Recipe ¼)

(Review Experiments I, II, III, IV, V, and VI, pages 116, 117)

¼ c. cornstarch
2 c. scalded milk
¼ c. sugar
⅛ tsp. salt

Mix cornstarch, sugar, and salt. Add hot milk gradually, stirring constantly. Cook over a low fire for fifteen minutes, stirring occasionally after it thickens. Turn into individual molds dipped in cold water. When firm turn from the molds and serve with whipped cream sauce or with plain thin cream. This recipe may be varied by folding the beaten whites of two eggs into the hot pudding. Mold and serve with a soft custard for a sauce. (See page 132.) This will almost double the quantity of pudding.

Whipped Cream Sauce (Class Recipe ½)

¼ c. milk
¼ c. sugar
¼ c. cream
½ tsp. vanilla extract

Dissolve the sugar in the milk, whip the cream, and beat it into the milk.

* Prune Pudding (Class Recipe ¼)

24 medium-sized prunes
1 c. sugar
1⅓ c. boiling water
⅓ c. cold water
2 c. cold water
1 in. stick cinnamon
⅓ c. cornstarch
1 tsp. lemon juice

Pick over and wash the prunes. Soak for one hour in cold water. Cook until soft. Take out the stones. (A few of the pits may be mashed and added to the pulp if desired.) Simmer prune pulp, cinnamon, and boiling water together for ten minutes. Add cornstarch rubbed to a paste with the cold water. Cook for five minutes and add lemon juice. Mold and serve with whipped cream.

If preferred the skins of the prunes may be removed.

* Bread Pudding (Class Recipe ⅓)

(Review Cup Custard, page 132)

A bread pudding properly cooked is a nutritious and easily digested dessert; what is its food value?

3 eggs
½ c. sugar
½ c. raisins if desired
any desired flavoring
3 c. milk
3 thin slices buttered bread
or ¾ c. stale crumbs
⅛ tsp. salt

Scald the milk. Butter the bread and cut each slice into three strips. Lay the bread in a baking dish. Beat the eggs slightly. Add sugar and salt. Pour the milk gradually over it. Add raisins if they are to be used. Pour the liquid over the bread and let stand for twenty minutes. Then place the dish in a pan of hot water and bake in a moderate oven until the custard is set. Serve warm or cold. A meringue (see page 133) may be spread over the top and browned. This pudding may be steamed. What is the proportion of milk to eggs? What is the thickness or consistency of the pudding when done? Compare with cup custard.

Caramel Bread Pudding

Proceed as above, omitting the raisins and two tablespoonfuls of the sugar, and adding four tablespoonfuls of caramel syrup. (See page 237.)

* Rice Pudding

(Review Rice)

1 tbsp. rice
1 tbsp. sugar
2 c. milk
¼ c. raisins
⅛ tsp. salt

Wash the rice. Put it in a baking dish. Pour in the milk and soak for half an hour. Add raisins and sugar, and cook in a slow oven until thick and creamy. With a spoon occasionally cut the top skin down into the pudding. The pudding must not boil. Serve with cream or milk.

Tapioca Pudding (Class Recipe ¼)

¾ c. tapioca
1 c. raisin
3 c. boiling water
a small piece of orange peel if desired
½ c. sugar
1c. cold water
⅛ tsp. salt

Soak the tapioca for one hour in the cold water in the upper kettle of a double boiler. Add the hot water while stirring briskly. Cook over the fire for fifteen minutes. Add sugar and salt, raisins and orange peel, and steam in double boiler for one and one-fourth hours. Turn into a bowl and serve when cool with milk or cream.

Apple Tapioca

Proceed as above. Pour the boiled tapioca over three thinly sliced apples in a baking dish and bake until the tapioca is clear.

Tapioca is made from the juice of the roots of South American cassava. It is largely starch. (See Table, page 116.)

Steamed Suet Pudding (Class Recipe ¼ for Group of Four)

2½ c. flour
2 tsp. cinnamon
1 c. molasses
1 c. suet
1 c. chopped raisins
1 tsp. soda
1 c. sour milk

Sift the dry ingredients together. Pick the suet apart, removing all membranes, and chop fine. Add to the flour mixture. Mix the milk and molasses, stir it into the flour, add the raisins, and fill well buttered molds two-thirds full. This quantity makes two puddings large enough for an ordinary family. These puddings may be kept in a cool place for several days and reheated for serving. The molds with a tube in the center are the best, but a lard pail or a one-pound baking powder can may be used. For class work a small baking powder can may be used for a group of four. Steam for two hours according to directions for steaming brown bread. Serve with liquid or hard sauce.

Pudding Sauce No. 2

1 c. sugar
⅛ tsp. nutmeg
¼ tsp. cinnamon
2 tbsp. flour
2 c. hot water

Proceed as for Pudding Sauce No. 1. Mix spices in flour and cook for ten minutes.

Hard Sauce

1 c. sugar
⅓ tsp. nutmeg or cinnamon
⅓ c. butter

Cream the butter and sugar well together and add flavoring.

Fruit Shortcake

(Review Biscuit)

Make a crust like biscuit, using four teaspoonfuls of baking powder and four tablespoonfuls of lard to one pint of flour. Moisten with one cup of milk. This crust will be very soft and must be handled as little as possible. Roll the dough quite thin and cut in half if for a square pan. Lay one sheet in a greased pan. Brush the top with melted butter and lay the other half over it. Bake in a quick oven for twelve or fifteen minutes. When done pull the cake apart. Lay one half, crust side down, on a large platter. Spread with butter, and put on a layer of sweetened fruit such as peaches or strawberries; lay on the other half, crust side down. Butter and cover with fruit or whipped cream, or both, and serve immediately.

For a round pan divide the dough before rolling and pat into shape.

Individual Shortcakes

Cut the dough with a large biscuit cutter and finish as above.

Strawberry Shortcake with Meringue

Use two boxes of berries crushed slightly and sweetened; spread the top with whipped cream or strawberry meringue. For the meringue use one-half cup powdered sugar, one-half cup crushed berries, and the white of one egg. Crush the berries and drain off the juice (it may be used on the cake). Put the egg, sugar, and berries in a bowl and beat all until very stiff, then heap it on the cake.

QUESTIONS AND PROBLEMS

Why should desserts be carefully selected? What is the chief food element in most desserts? Which is the richer in protein—bread pudding or rice pudding with eggs? (See page 360.) What desserts would you select to follow a meal with an abundance of meat? To follow a meal where no meat was served? Should bananas be served after a meal rich in starch? Give a dessert that might be served after a meal where roast pork was served. Write a menu with which you could serve cornstarch pudding. One where rice pudding with eggs would be appropriate. Give menus using cup custard, apple dumplings (see page 361), a dish rich in whipped cream. Which is the more indigestible—the puddings just mentioned or the steamed puddings? Would you serve suet pudding in hot weather? Which would be the most easily digested—suet pudding, apple dumplings, or fruit shortcake? Why? Why is lemon pie very indigestible? Why not serve acid sauces with cornstarch or tapioca pudding? Make a list of the puddings given that you could use often in your menus without overtaxing the digestion. Add to the list any other desserts given elsewhere in the book. (See Eggs and Frozen Desserts.) Note under each title the quantity, cost, and time required for preparation.

Supplementary Recipes

Angel Cake with Strawberries (p. 360)
Charlotte Russe (p. 360)
Date Pudding (p. 360)
* Rice Pudding with Eggs (p. 360)
Individual Plum Pudding (p. 361)
* Apple Dumplings, No. 1 (p. 361)
Apple Dumplings, No. 2 (p. 362)
Peach Shortcake (p. 362)

CHAPTER XIX

GELATIN AND FROZEN DESSERTS

GELATIN DESSERTS

Gelatin jellies owe their food value to the sugar they contain. A pound of jelly has a fuel value of 405 calories. Compare this with a pound of wheat bread, which has a value of 1205 calories. Weigh and measure your jelly. What part of a pound is a serving? What does a five cent loaf of white bread weigh in your city?

IMPORTANT POINTS IN MAKING GELATIN JELLIES

1. Buy a good grade of gelatin.
2. Use the proper proportion of gelatin to liquid. This varies with the different brands and depends also on the time for thickening, the temperature, the moisture in the air, and the fruit used. The usual quantity is one-half box, or one ounce (from two to two and one-half tablespoonfuls) of granulated gelatin to one quart of liquid; if too much gelatin is used the jelly will be tough. Where the jelly must be made quickly use three and one-half cups of liquid to an ounce of gelatin.
3. Soak the dry gelatin well in cold water. Gelatin will take up four times its weight of water. If milk or broth is used a little more liquid will be needed. About four parts of water to one of gelatin is the average quantity.
4. Dissolve the gelatin carefully in the hot liquid with as little stirring as possible.
5. Use earthenware or china molds. Why?
6. Strain jelly through double thicknesses of cheesecloth wrung out of hot water.
7. Keep jelly in a cool place away from the dust. It will set in from three to five hours. Jelly cooled in a dusty place may liquefy. Why? (See page 30.)

8. In damp or warm weather use a little more gelatin than in cold weather.

9. Gelatin combined with whipped cream or eggs must be of the same consistency as the mixture to which it is added or it will sink to the bottom of the mold. If too thick it will not blend but will be in lumps.

Cooking gelatin is apt to spoil the flavor. Gelatin boiled for a short time will become firm when cooled, but if the boiling is long continued its gelatinizing power is lessened and finally destroyed. Acids should not be added to gelatin until it is partially cooled because they act on the gelatin in such a manner that the gelatinizing power is lessened. Pineapple dissolves gelatin as it does other proteins and cannot be molded with it unless it is to be used very promptly.

*** Lemon Jelly with Bananas (Class Recipe)**

Beginning pupils may make plain lemon jelly. One custard cup of jelly is molded by each pupil. Allow one-half of a banana for each desk. The number of lemons will depend on the quality. It is well to measure the juice of one lemon and see how many lemons will be needed. Ice will be needed so that the jelly can be chilled and the lesson finished in the allotted time.

1 tbsp. granulated gelatin	3 tbsp. cold water
⅝ c. boiling water	¼ c. sugar
2 tbsp. lemon juice	the thin yellow rind from ¼ lemon

Soak the gelatin in a small bowl in the cold water. Pour the boiling water over the sugar in a small, smooth saucepan. Add the lemon peel and boil until slightly yellow. Pour this over the gelatin, and stir occasionally until dissolved. When slightly cool add the lemon juice and strain through cheesecloth into custard cups that have been dipped in cold water. Set them in a mixture of ice and salt to become firm.

How much gelatin to a quart of water was used in the class recipe? What is the usual proportion? Write a recipe for lemon jelly for home use which contains one quart of liquid and the proper proportion of gelatin.

*** Jelly Molded with Fruit**

Strain a little of the jelly into each mold and the remainder into a cup. Place both in a mixture of ice and salt. Add a few thin slices of banana to the mold. When the jelly is set add another layer of gelatin from the cup, then put in more slices of banana. Continue this until the

mold is full. If the jelly in the cup is getting too firm put it into a pan of water that is not very cold. Let the molds stand as long as possible after they have set. An hour is best, but if the time is limited, they may be removed from the mold very quickly.

To Remove Jelly From Mold. Pass a knife around the top of the mold to loosen the jelly. Stand the mold in hot water for a few moments. Wipe dry. Turn to one side to see if the jelly is loosened. Place a saucer over the top and turn the whole upside down. Then lift off the mold.

*** Strawberry Bavarian Cream**

2 tbsp. granulated gelatin
1 pt. strawberry pulp and juice
1 pt. cream
½ c. cold water
½ c. powdered sugar

Soak the gelatin in the cold water. Wash the strawberries, drain, and mash through a sieve. Add the sugar to this juice. Stand the gelatin over the hot water until dissolved. Then add it to the strawberry juice. Set the bowl in ice water or in cracked ice and as soon as it begins to set fold in the cream which has been whipped stiff. Turn into a mold and let stand for two hours. Lay on a flat dish and serve plain.

Strawberry Cream Molded with Orange Jelly

2 tbsp. gelatin
1½ c. boiling water
1½ c. orange juice
a little shaved orange peel
½ c. cold water
1 c. sugar
3 tbsp. lemon juice

Proceed as for lemon jelly, but leave the orange peel in the syrup barely long enough to flavor it slightly.

To mold the jelly select two molds of the same shape, one smaller than the other. Dip the larger one in cold water and pack in ice; then pour some of the gelatin in the bottom, having it as thick as that in the space between the two molds. When it hardens, dip the smaller mold in cold water and place it in the larger one on the gelatin. Fill the inner mold with cracked ice, and pour in enough very cold jelly to fill the space between the molds. Let stand for two hours. Remove the cracked ice and dip the water from the inner mold. Wipe the inside of the inner mold with a hot cloth. Loosen the jelly around the top and lift out the mold. Fill the space with strawberry Bavarian cream, and let the mold stand in ice for two hours. When ready to serve plunge in warm water for a few moments and turn into a cut glass dish.

QUESTIONS AND PROBLEMS

From what is gelatin made (see page 149)? What does it cost per pound? What is the fuel value of a pound of gelatin? Of a pound of sugar? How many calories of fuel value in one quart of lemon jelly? How many calories does a person get who eats one-sixth of a quart of jelly? What does it cost? Which is of higher food value, a serving of lemon jelly or two sweet oranges?

How much cold water is needed for soaking one tablespoonful of gelatin? How much liquid for dissolving the same amount of gelatin? Why does dust sometimes cause jelly to liquefy? Why do gelatin mixtures with cream, beaten egg, and other liquids sometimes lump?

Why were ice and salt used to pack the jelly made at school?

FROZEN DESSERTS

Ice cream and sherbet if eaten after a heavy meal retard digestion because of their richness and because they lower the temperature of the stomach. They should be eaten very slowly. If used as dessert choose them according to the meal that precedes them. Ice cream would not be appropriate on a rich menu; a sherbet or water ice would be more suitable. It is a mistake to think that ice cream is a light dish with little food value. It is usually of high food value, depending, of course, on its ingredients. Compute the food value of one-fifth quart (the amount usually served to one person) of Philadelphia, French, and plain ice cream.

For invalids ice cream should be served as a meal alone. If taken very slowly it is an agreeable way in which they may take milk, eggs, and cream.

FREEZING MIXTURE

EXPERIMENT I. Surround a tin measuring cup half full of water with cracked ice. Test with a thermometer. How long is it before the temperature begins to fall? When does it become stationary?

EXPERIMENT II. Repeat Experiment I. Use one tablespoonful of coarse salt to one cup of cracked ice.

EXPERIMENT III. Repeat Experiment I. Use one tablespoonful of salt to four tablespoonfuls of ice. Note the difference in rate in fall of temperature. Is there any difference in final temperature obtained in Experiments II and III?

The water was cooled because its heat was used to melt the ice; the ice melted more rapidly when salt was used. Salt has a great affinity for water and thus the heat was taken from the water very rapidly.

PROPORTIONS OF SALT AND ICE

For Ice Cream. Use three parts of finely cracked ice and one part of coarse salt for freezing ice cream and ices where a fine grain is desired. Large pieces of ice with fine salt will melt slowly and will require much time.

For Frappés and Water Ices. Where coarse grain is desired use equal parts of ice and salt.

For Packing. After the cream is frozen use four parts of ice to one of salt.

FREEZING ICE CREAM

Scald and cool the can and pour in the liquid. Fill the can not more than two-thirds full, as liquids expand when frozen (See Ice, page 75) and the cream will run over if too much is put in. Crack the ice fine, using a bag of heavy duck and a mallet. Put it into a pan and mix the salt with it. Place the can in the freezer. Put on the lid and turn the crank several times to see if it runs smoothly. Set the freezer in a large pan on a table of convenient height. Pack the ice and salt closely around the can, turning occasionally. The packing should come nearly to the top of the can. If only a little cream is to be frozen the packing should be just a little above the cream. Do not draw off the water while freezing the mixture. Add more ice and salt, if needed.

Turn the freezer slowly at first. If turned too rapidly the cream will not be smooth. After it has begun to freeze turn faster. When the cream is quite firm wipe the top carefully with a damp cloth. Remove the lid, take out the dasher, and scrape the cream from the sides of the can; press it down firmly and cover with a waxed paper. Put on the cover and stop the hole in the top with a cork or paper. Drain off the water, pack with ice

and salt, cover with a heavy cloth, and let stand for at least an hour to ripen.

Freeze sherbets, water ices, and frappés as directed for ice cream; turn the crank rapidly for a few moments, then turn a little every five minutes until stiff.

Ice Cream Without a Freezer. Ice cream may be frozen in a pound baking powder can inside a five-pound lard pail. Fill the space about the can with ice and salt, then cover closely. Scrape the cream from the sides of the can, and stir twice at intervals while freezing. A glass jar may be used instead of the baking powder can but it must not be too full or it will crack.

To Remove Ice Cream from Mold. Dip the can in cold water. Wipe it dry and invert on a cold platter. The small brick molds may be handled in the same way.

MOLDING ICE CREAM

When the cream is very firm it may be packed in molds Individual molds in elaborate forms are too difficult for beginners to use. They should use either brick or melon molds. Scald the mold. Cover closely and pack in ice and salt until very cold. Fill with cream, packing it very firmly. Cover it with a piece of heavy buttered muslin. Put the unbuttered side next to the cream. Put on the lid and bind a narrow strip of muslin that has been dipped in melted butter or other sweet fat around the joining of the lid and the mold. Pack immediately in ice and salt (half of each) and let stand for two hours. If to be kept longer, repack. If two colors are used put the color that is to be on top in the mold first.

*** Philadelphia Cream (Class Recipe ⅛)**

(Review Milk and Freezing Mixture)

1 qt. thin cream	¾ c. sugar
1 tbsp. vanilla	few grains salt

Mix the cream and the sugar, and stir until dissolved. Flavor, and freeze. Scalded cream is smoother than the uncooked cream, but if thin cream is to be used it will seem richer unscalded. What is the proportion of sugar to one quart of liquid?

* Plain Ice Cream (Review Custards)

2 tbsp. flour
⅛ tsp. salt
1 c. cream
⅞ c. sugar
3 eggs
3 c. milk
1 tsp. flavoring

Make a white sauce of the milk and flour. Cook ten minutes. Add egg beaten with sugar and proceed as for custard. When cool add cream and flavoring. Why is more sugar added than in the preceding recipe?

French Ice Cream

2 c. milk
2 c. cream
1 c. sugar
6 egg yolks
1 tsp. vanilla

Proceed as for plain ice cream.

* Chocolate Ice Cream

Melt two or four squares of unsweetened chocolate. Add to it part of the sugar. Then add it to the hot cream, milk, or custard in Philadelphia, French, or Plain Ice Cream.

Strawberry Ice Cream

Hull and wash two boxes of strawberries. Crush through a sieve, and add one-half cup of sugar. Add this to Philadelphia ice cream when frozen to a mush. Do not add fruit to any but pure creams that are very rich.

* Lemon Sherbet

2½ c. sugar
½ c. lemon juice
2 very fresh egg-whites
1 c. shredded pineapple
4 c. water
grated rind of 1 lemon (yellow part only)

Cook sugar, water, and lemon rind for five minutes. Add lemon juice and pineapple and when nearly cold strain through cheesecloth. When frozen to a mush add eggs beaten very stiff. A small can of cherries well aired and cut fine, a cup of fresh cherries stoned and chopped, or the juice and pulp of three oranges may be added. What is the proportion of sugar to lemon juice? How much water is used? Is this the same proportion that is used in lemonade?

Café Frappé

1 egg-white
½ c. cold water
½ c. ground coffee
4 c. boiling water
1 c. sugar

Proceed as for boiled coffee. (See page 80.) Strain, add sugar, cool, and freeze as directed for frappés. Serve in tall glasses with whipped cream sweetened and flavored.

QUESTIONS AND PROBLEMS

Why are ice creams objectionable after a heavy meal? What ices would you select for dinner? Why not put fruit in French ice cream? Which is the best ice cream for an invalid? Why does a mixture of ice and salt cool? Compare the cost of ice cream salt and table salt. Give directions for freezing ice cream. Water ice. For packing them. Give proportions of ice and salt used.

Supplementary Recipes

Caramel Cream (p. 363)
Grape Juice Sherbet (p. 362)
Orange Ice (p. 362)
Peach Ice Cream (p. 363)

CHAPTER XX

RULES OF ETIQUETTE AND SERVING

Make the table as neat and attractive as possible. Not only does a dignified and courteous serving of the family meal aid digestion, but it teaches a refinement of manner that distinguishes the well-bred from others. Children should not be allowed to eat hastily and rush away to play; if the meal is very long they may be excused upon a quiet request.

Never speak of unpleasant subjects at table, such as death, disease, and great disasters. Cultivate the art of conversation at table; save amusing stories for the occasion. The old rule that children should be seen and not heard should not apply at the home table. They should be expected to do their part in the conversation, as they will gain much social training in this way.

A Dinner Invitation. An invitation to dinner must be graciously accepted or declined immediately with regret. An invitation should not be accepted conditionally, as the number invited is limited and the hostess may wish to fill the place of an invited guest who cannot be sure of being present. If one accepts, nothing except illness, or some equally urgent reason, is an excuse for not attending. One should reach the house not less than five minutes or more than fifteen minutes before the hour and should remain for half an hour or more after the dinner. *Never be late.*

Formal dinner invitations are written in the third person; other dinner invitations may be given verbally or by an informal note. (Ask the English teacher to give a lesson on formal and informal invitations. Be very particular about the appearance of the notes.)

TABLE ETIQUETTE

The hostess will indicate the chair one is to occupy. Stand at the back or side of the chair until she gives the signal. Then be seated from the left; arise from the same side. Gentlemen arrange chairs for the ladies and remain standing until they are seated. If the ladies withdraw from the dining room before the gentlemen, the gentlemen rise.

In sitting at the table place the chair far enough away to bend forward without touching the table. Then there will be no temptation to put the elbows on it. Sit erect and keep the feet on the floor.

When the dinner is over put the napkin loosely at the side of your plate, unless you are to be a guest for following meals; in this case, fold the napkin. Handle it with as little display as possible. Do not put it on the table until the hostess lays hers down.

If in doubt about any point follow the example of the hostess.

Do not play with the silver or put the hands on the table.

One should not reach across the table in front of one's neighbor.

In asking to have anything passed mention the name of the person spoken to. In offering to serve anything say "May I help you?" "May I offer you?" "Let me give you." In refusing food never say "I do not like that;" say "Thank you, I do not wish any."

Be attentive and courteous to the other guests even if they are not congenial to you. This courtesy is due the hostess. If one must leave the table before the other guests, ask permission of the hostess.

Keep the knife across the edge of the plate when it is not in use. It is used only for cutting. The fork is held in the left hand with the tines down when the right hand is used for cutting food with the knife. Do not cut or mix all the food at once. Cut just what is to be eaten at the time. Use the fork to cut everything soft. Lay the fork across the plate when not in use, next to the sharp edge of the knife.

One hand at a time may be put to the mouth when eating chicken from the bone, celery, asparagus, corn from the cob (the cobs should be cut in short lengths), lettuce rolled and dipped in dressing, radishes, and bread. Do not take more than two mouthfuls in succession while the hand is up.

Do not butter all the bread at once, but break in pieces and butter as eaten. Keep bread on the bread and butter plate or on the dinner plate; never on the tablecloth.

Do not pound salt shakers on the table to loosen the salt. Take salt from a salt cellar with a salt spoon or the tip of a knife. Put it on the plate; never on the tablecloth. Never dip food in salt used by others.

Do not drink from the spoon; use it for stirring only. It may be used to see that a beverage is properly sweetened. Take food from the side of the spoon; never from the tip. Do not leave the spoon in the cup. Lay it on the saucer at the right and parallel to the handle of the cup.

In eating soup dip away from the body, and take it from the side of the spoon. Do not put bread or crackers in soup.

Do not blow upon any food to cool it. Never pour hot beverages into a saucer.

Do not make a noise when eating food.

Drink from the water glass held in the right hand with the fingers around the tumbler, near the bottom. Drink only a little at a time. Do not drain the glass at one drinking.

Eat with the mouth closed, and do not try to speak with food in the mouth.

In sending the plate back for a second helping lay the knife and fork across it and a little to one side.

Keep the plate neat. Do not scrape the plate or tilt dishes to remove the last bit of food.

SETTING AND DECORATING THE TABLE

The Dining Room. Have the dining room clean and well ventilated. Have the tablecloth and napkins spotless, even if nothing better than white oilcloth and paper napkins are to be

had. Adjust shades or curtains so that the light is not in the eyes of those seated at the table. Put chairs up to, but never under, the table.

The sideboard, on which is arranged needed silver, china, and finger bowls, should be covered with a perfectly laundered cloth. Hot dishes are not put on the sideboard.

The serving table should be protected by an asbestos pad, then covered with a smooth linen cloth. On it place serving trays, hot dishes, and other food.

Everything should be conveniently placed before dinner is announced.

Setting the Table. First cover the table with a silence cloth or a quilted or asbestos pad. The tablecloth should be laundered without starch. (See Laundering.)

Place the center of the cloth in the center of the table, and have opposite sides the same distance from the floor.

The Decorations. The table may be made attractive by the use of fruit or flowers as a centerpiece. For the breakfast or luncheon table place a dish of fruit, a low vase of flowers, or a growing plant in the center. For the dinner table use flowers or a plant.

The appearance of the food itself is another decorative feature. The dish selected for food must be so large that the edges will remain clean. Do not fill any dish too full. Meat, especially if it is to be carved, must be put on a comparatively large platter. If food is served in the dish in which it is cooked a napkin arranged in several diagonal folds may be neatly pinned around it. A pudding dish or a casserole with an outer dish of silver or china may be used. Bowls or small dishes for sauces or other foods that are apt to soil the tablecloth should have a small plate or tray underneath.

Desserts with very thin sauces are more attractive if served in deep rather than shallow plates. Biscuit or rolls of symmetrical and even size, bread cut in neat squares or oblongs, cake or pie neatly cut, and all browned to an even golden hue are decorative, as are rich, brown, juicy meats and golden brown

potatoes. A stew served in a border of well-browned potatoes furnishes a pleasing contrast for the eye as well as for the palate. A brown stew with a border of white potatoes or rice is very attractive. Vegetables must be well drained, never watery. For example, spinach surrounded by water is unappetizing, but put in a neat mound garnished with egg is pleasing to the eye. Always keep the appearance of the various dishes in mind when planning your menus.

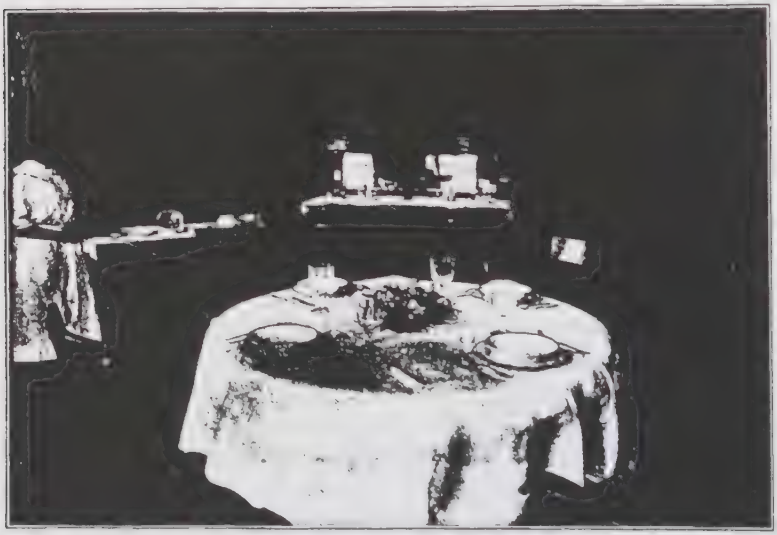
Anything used for a garnish must be very dainty and attractive, and should be edible. Parsley is one of the most popular articles used in this way; it is also a condiment and is believed to be an aid to digestion. It should be very clean and crisp and the curled variety is to be preferred. If grown in a window box or a flower bed it is always to be had when needed. A single garnish used repeatedly, however, is as monotonous as a single method of preparing a certain food. Lemon in slices or eighths is used with fish and some meats. Curled celery is another appetizing garnish. Tiny red radishes with the skin curled back are attractive for ham or beef, and eggs in various forms may be used for many vegetables. Salads may be served on beds of crisp, dry lettuce or cress, in apple cups, or in tomatoes, or green peppers. Avoid an excess of carelessly prepared greens. A sprig or two of parsley at the ends of a platter of steak is appetizing, but a whole bunch detracts from the food.

Fruit may be served in low bowls, platters, or baskets with a few perfect leaves. Grape and peach leaves are very effective. Desserts may be surrounded by whipped cream or decorated with a meringue. Gelatin and cornstarch desserts may be turned from the mold on platters or shallow bowls. Ice cream may be molded and garnished with fresh or candied fruit.

The Cover. The space occupied by the plate and silver for each person is known as the cover. Allow as much space as possible for this (at least twenty inches is needed for comfort, and twenty-five to thirty is better). A cover should occupy a space fifteen inches in depth from the edge of the table.

The place of the hostess is at the end of the table nearest

the door of the drawing or living room, as she enters the room last. Where the hostess is both cook and waitress and must rise from the table during the meal, it is more convenient for her to sit near the kitchen door. The host sits opposite the hostess. The place of honor for gentlemen is at the right of the hostess; for ladies, at the right of host.



DINNER TABLE SET FOR SOUP COURSE

Arrange all dishes so as to give the table a symmetrical appearance; this does not necessarily mean in straight rows. All dishes and pieces of silver should be placed at least one inch from the edge of the table.

If there are no warm dishes to be served, put a plate right side up in the center of each cover. The decorations on the plate should face the guest. (At formal dinners a handsome plate known as the service plate is placed at each cover and is not removed until the main hot meat course appears. In this style of service the place before the guest is always occupied by a

plate until the table is cleared for the dessert. As the waitress removes one plate she places another that has been served.)

Knives are placed at the right, sharp edges turned to the plate; forks at the left, tines up; teaspoons at the left of the plate, bowl up; soup and cereal spoons are placed at the right. The silver is placed in the order in which it is to be used; that used first farthest from the plate.

If the table is to be cleared before the dessert and coffee are served do not put on dessert spoons or forks or coffee spoons when setting the table.

The water glass is placed at the tip of the knife, top up. The bread and butter plate is placed at the tip of the fork. Place the napkin at the left, neatly folded in a square. Never arrange it in the irregular forms seen in some public eating places.

Place the soup ladle in front of the hostess or at the right, handle to the right and bowl up.

Place carving set in front of the host, or put carving knife and gravy ladle at his right, and fork at his left.

Place several tablespoons and forks, if needed, at each end of the table, or lay one beside each place where the dishes to be served will be placed.

If tea or coffee is to be served before the table is cleared, arrange the cups and saucers at the left of the hostess, handles turned the same way, and cream pitcher, sugar bowl, and coffee pot at the right (either on a tray or separate), the whole forming a semicircle.

Put the water pitcher or carafe (a glass water jug) in front of the person who is to replenish the glasses. If a waitress is at hand the water is put on the sideboard.

At informal meals the butter dish may be placed at one side of the center of the table, with the butter knife at the right. If butter is served in balls a small butter fork is used instead of the knife.

Put salt and pepper at each side of the center of the table or at each end. If individual salt and peppers are used place before each cover.

Finger bowls are filled one-third full of fresh cold water. In them there may be a geranium leaf or a rose petal. They are placed on the sideboard before the meal is announced. Where fruit is served first at an informal meal the finger bowls may be placed on the table at the beginning of the meal, on a doily or on the fruit plate; (the bowl is lifted from the plate as the fruit is passed), or in front of the plate. If the fruit is on the plate when the meal is announced, put the bowl on a doily in front of the plate. A fruit course of sliced peaches or berries that have been hulled or any fruit that does not soil the fingers does not require finger bowls.

At the end of a formal meal place each finger bowl on a dainty doily on a small plate. When the coffee is served place finger bowl in front and a little to the left of guest.

The Breakfast Table. (Review general directions.) Arrange the table for breakfast as directed, selecting the dishes according to the menu. Put butter and jam or other sweet on the table.

Serving the Fruit Course. If fruit is served first put the fruit plates with the finger bowls in the center of the space allowed for each person. Place a silver fruit knife at the right on the fruit plate if it will be needed. Put a fruit spoon if required at the right, outside the breakfast knife.

At a very simple meal butter may be placed on the breakfast plate or on a small butter plate instead of using the bread and butter plate.

Put the cereal in a covered dish before the person who is to serve it, with the cereal bowls or saucers at the left.

Unless they are being warmed, place the breakfast plates at the left of the space intended for the hot dish that is to be served by the host. After the fruit course and the finger bowls are removed serve the cereal. When the cereal dishes are removed place the hot dish before the host, or if eggs in cups are served place them when the cereal bowls are taken away.

Hot bread and potatoes are placed on the table at the sides. If a waitress is in attendance she may first pass them.

The Supper or Luncheon. Supper or luncheon may be served as directed for breakfast. Fruit may form the first course at luncheon and may be served as at breakfast, or it may be used for dessert.

At supper small plates are used if no meat is served. If preserves are used place the dish before the person who is to serve it with dessert saucers at the left. If the supper plates have had nothing in them that will spoil the flavor of the preserves, it may be served on them at a very informal meal.

Dinner. Even if one has no waitress dinner should be served in as dignified a manner as possible. Set the table carefully, using dinner plates.

At the family dinner the carving is done at the table. The soup, vegetables, salad, dessert, and tea or coffee, also, are served at the table. It is permissible for those at the table to pass the vegetables, or some one near the carver may put them on the plate with the meat.

If the table is carefully set the person who acts as waitress need leave her seat but twice—once after the soup, and once before the dessert. The one who cooks should not be expected to leave her place to serve.

Boys should take turns with their sisters in serving at the table when there is no waitress.

When soup forms the first course, place the tureen before the one who is to serve, and the warm soup plates directly in front of and almost touching it. (If many plates are needed do not put them in one pile.) Remove the lid, turning it upside down. After the first course remove the tureen, then the plates, taking them one at a time instead of piling them together. Then bring on the hot dishes, including the warm dinner plates. Refill the water glasses.

Before the dessert is served remove everything except water glasses and carafe; then place the dessert before the one who is to serve.

A FEW GENERAL RULES

Fill water glasses to within an inch of the top just before the meal is announced. When the glasses are to be refilled draw them to the edge of the table at the right of the guest, putting your hand near the bottom.

Dishes intended to be cold should be cold; dishes intended to be hot should be hot. Plates must be warmed if the course requires it. Bread, cakes, and some pastry may be served at the room temperature.

Serve from the left everything to which the guest helps himself. Serve from the right everything which is to be set down before the guest. Remove everything from the right. A newer and more convenient rule is that everything except beverages should be served from the left, and everything removed from the right.

Use a tray for removing small dishes and silver. Take large dishes on your left hand or on both hands with a folded napkin underneath. Be careful not to put the fingers over the edges of the dish. Put a spoon or a fork, or both, if needed, in each dish to be served. Place them on the side next to the guest. Hold the dish low enough for the guest to help himself conveniently.

In removing a course take the large dishes first, then the plates. All that belongs to one course is removed before the next is brought in. Never reach across a cover. Never pile dishes one upon the other. Small dishes may be placed side by side on a tray, but when a number of guests must be quickly served by one waitress she may take the dinner plate in one hand, placing a small dish (if one has been used for juicy vegetables) on the plate at the side of knife and fork and taking the bread and butter plate in her other hand. This leaves each cover clear as she passes around the table.

Before the dessert is brought, remove crumbs as quietly as possible, using a silver crumb knife or a napkin (a soft napkin is preferable on a polished table) and a silver tray or a plate, passing to the left of the guests. Crumbs may be removed between courses if necessary.

FORMAL SERVICE

The table should be supplied with a handsome and spotless damask cloth over a heavy silence cloth. The tablecloth should extend at least a quarter of a yard over the edge of the table. For luncheon the polished table is often used without a cloth, but the table must be quite handsome if set without a cloth. A number of doilies of lace or embroidery are needed to carry out this plan. They should be of linen and not over decorated. A round table lends itself more easily to decoration than a square one and makes it easier to engage in general conversation.

In setting the table, apply the rules given. The oyster fork is placed at the right of the soup spoon. A fork is used for all desserts if possible. Bread and butter plates are not used at formal dinners. A dinner roll or a piece of bread two inches long and half an inch thick may be laid between the folds of the napkin. Menu cards are not used at private dinners. Place cards may be used for large dinners or luncheons. They should be small and dainty and are placed in front of the service plates.

Decorations should be simple and not high enough to obstruct the view across the table. The lights should be shaded and placed no higher than the heads of the guests. Candles may stand just outside the centerpiece or may be placed near the four corners of a square table. One candle to two guests may be used. Candle shades and holders should not be too elaborate. Bon bons and salted nuts may be put on the table in crystal or silver dishes.

Serving. At formal dinners the main courses, such as soup and meats, are served from the pantry. Portions are put on the plates and placed before the guests. Dishes that accompany the course are offered on a tray, which is held low enough for the guest to help himself. If the party is large, this style of service is possible only with several maids. (For family use or for small dinners the method may be modified; if a fruit cocktail or oysters are served first, they may be on the table when dinner is announced or may be served from the pantry after the guests are seated.) After this course is removed the soup is

served. The waitress should pass to the right of the guest at the hostess' right, and put the plate before him on the service plate. After all are served at the right, she should begin at the hostess' left. If fish is served, the fish platter should be put before the host. The warmed fish plates should be placed in piles of three or four at the side or brought from the sideboard. The waitress should first serve the guest at the right of the hostess, removing the service plate with her left hand and putting the fish plate in its place, then proceeding as for the soup until all are served. Cold relishes, such as cucumbers or tomatoes, should be served on small plates at the left of each cover. The fish sauce should then be passed, then potatoes or other starchy vegetables.

If an entreé (a dish such as creamed sweetbreads as a course alone) is used, it is served from the serving table.

The chief meat course is served from the pantry or by the host in the manner in which the fish is served. Then the starchy vegetable should be passed on a tray; then the green vegetable such as peas, and tomatoes; then the meat sauce; then bread or rolls if needed. This course should be removed as directed for fish, a salad plate being placed before each guest (with the salad on it, if served from the pantry) when the meat plates are lifted.

Only vegetable salads are served at dinner. At small dinners the French dressing may be made at the table by the hostess, but it is usually made in the pantry. The salad bowl should be placed on a tray before the hostess, with a salad fork and spoon in the bowl, and an extra salad plate before her. The plates when served should be placed before the guests in the order given, and the empty salad plates removed. Then wafers and cheese, if they are to be served, should be passed on a tray. When the salad course is removed, the bowl should be taken first; then plates; then salt, pepper, and relishes. Only confections, water glasses, and decorations should be left. The crumbs should be removed very quietly before the dessert is served.

The dessert plate with the proper spoon or fork, and a finger

bowl on a doily, should be placed before each guest. The dessert is put before the hostess; each guest lifts the finger bowl and doily and places them in front and to the left of his dessert plate. As soon as the hostess serves a plate, it is put before a guest, and replaced with a fresh dessert plate. The dessert may also be served from the pantry.

QUESTIONS AND PROBLEMS

What do you think of the importance of observing correct social usages at the family table? Why do good manners help digestion? What subjects should be omitted from conversation at the table? Why? How may you become a better conversationalist?

Why should dinner invitations be promptly accepted or declined? Write a formal acceptance of a dinner invitation.

Read aloud carefully the rules given regarding the manner of eating. Do you observe them? If not, try to correct your habits.

What is the proper temperature for the dining room? What can you say regarding light in the room? How should the sideboard be arranged? Serving table? What material should be used for a silence cloth? Tell how to set the table. What is meant by a cover? Where is the hostess' place? Who leads the way into the dining room? Where is the seat of honor? How far from the edge of the table are dishes and silver placed? What is meant by a service plate? Draw a diagram of a cover as set for a family breakfast. For a formal dinner. Set the table, including decorations, and go through the form of service for a family breakfast, luncheon, dinner, and for a formal dinner. Write your menus first. (See Making Menus.)

What is the general rule for serving and removing dishes? What decorations do you consider appropriate for a dinner?

CHAPTER XXI

MAKING MENUS

(Review Daily Fuel Value Requirements, Page 43—Foods and Digestion)

***One Hundred Calorie Portions of Common Foods Ready to Serve**

	QUANTITY	WEIGHT	PRINCIPAL ELEMENTS
Almonds	12 to 15	.5 oz	Fat and protein
Apples	1 to 2	7.5 oz.	Carbohydrate, mineral matter, and bulk
Apricots (dried)	6 to 7	1.2 oz.	Carbohydrate
Bacon	1 or 2 small slices	.5 oz.	Fat
Bananas	1	5.5 oz.	Carbohydrate
Beans (dried)	2 heaping tbsp.	8. oz.	Protein and carbohydrate
Beef (round)	small serving,	2. oz.	Protein and fat
Bread	1 thick slice or 2 thin slices	1.4 oz.	Carbohydrate and protein
Butter	1 square or ball	.4 oz.	Fat
Buttermilk	1 glass (½ pt.)	8. oz.	Carbohydrate and protein
Cabbage	¼ small head	13.3 oz.	Bulk and carbohydrate
Celery	2 small stalks	21. oz.	Bulk, carbohydrate, and vegetable salts
Cheese	1½ in. cube	.8 oz.	Protein and fat
Chocolate (unsweetened)	½ square	.5 oz.	Fat
Cream	⅓ to ¼ c.	1¾ oz.	Fat
Dates	3 to 4	1. oz.	Carbohydrate
Eggs	1¼	4. oz.	Protein, fat and mineral matter
Milk	¾ c.	6. oz.	Protein, fat carbohydrate, and mineral matter
Oatmeal	a large serving	3. oz.	Carbohydrate, mineral matter, and bulk

*From Bulletins 28 and 142, Department of Agriculture.

One Hundred Calorie Portions of Common Foods Ready to Serve—Cont.

	QUANTITY	WEIGHT	PRINCIPAL ELEMENTS
Olives	7 to 8	1⅛ oz.	Fat
Oranges	1 large	10. oz.	Mineral matter and carbohydrate
Pickles	15 cucumbers (average size)	23. oz.	Condiment
Pork chops	1 small	3 oz.	Fat and protein
Potatoes	2 small ones	4. oz.	Carbohydrate and bulk
Potatoes (mashed)	2 heaping tbsp.	4. oz.	Carbohydrate and bulk
Prunes	3 to 4	1.2 oz.	Carbohydrate
Pudding, bread, rice, Indian, tapioca or cornstarch.	1 heaping tbsp.	2. oz.	Carbohydrate
Raisins	15 to 20	1. oz.	Carbohydrate
Rice (cooked)	2 heaping tbsp.	4. oz.	Carbohydrate
Shredded Wheat Biscuit	1 biscuit	1. oz.	Carbohydrate and protein
Sugar	2 tbsp.	1. oz.	Carbohydrate
Tomatoes (fresh)	3 to 4	1. lb.	Vegetable salts and acids, carbohydrate
Tomatoes (canned).	1 pt.	1. lb.	Vegetable salts and acids, carbohydrate

In planning meals for a day or a week there are several very important points to keep in mind, the most important being that a balanced ration should be provided,—one in which all classes of food are in the right proportion. (What per cent of food should be protein?) Unless all food is weighed and the fuel value of each of its food elements computed it cannot be exactly determined how much of each class should be eaten. As this is a long and tiresome process, most housekeepers depend upon their general knowledge of the composition of foods, and upon the guidance of the appetite.

A man of average weight for his height and age, whose work is light, needs seventeen calories per pound of body weight daily;

the average woman needs eight-tenths as many. Persons suffering from wasting diseases or convalescing from sickness that has left the body emaciated need a much higher caloric value and a greater proportion of protein than the robust adult. Children need a greater number of calories per pound of body weight—varying from forty-five calories for the first six months, to thirty at nine years of age, to twenty-seven at fourteen, and to eighteen at seventeen years of age. A boy of twelve or a girl of fifteen needs as much protein as a woman, and a boy of six needs half as much as a man.

In planning meals for children see that they get enough protein and fat, and plenty of fresh fruit and vegetables, and be sure that they do not eat too much sugar or sweets. A child needs a great deal more food in proportion to his weight than a grown person does, because the child is growing. A child of five needs almost half as much food as a man, but needs proportionately more fat and tissue building food than the adult. An active boy of fifteen requires as much food as a man. A middle aged person needs less protein than a young one. An active worker needs more food than one who leads a quiet life. When one is out of doors more should be eaten than when one stays indoors. If making a menu for persons who work indoors do not use foods that are difficult to digest; dried beans, for instance, are a good protein food for a man in the field, but not for a bookkeeper. Make a list of foods that are difficult to digest.

Some Coarse Foods Are Needed. Every menu should contain some bulky food rich in cellulose. The green vegetables and fruits and the coarse breads—corn, Graham, and whole wheat—are such foods. They prevent constipation—a condition that causes much ill health.

Another thing that should be considered in menu planning is the season or temperature. In summer, cooling foods are required and nature provides juicy fruits and vegetables, such as peaches, watermelons, and tomatoes. The winter vegetables, beets, turnips, and carrots, are richer in carbohydrates and conse-

quently furnish more heat. For those who keep their houses very warm and who wear much heavy clothing, some cooling foods are needed even in winter, therefore the canned summer fruits and vegetables and fresh ones, shipped from warmer climates are desirable.

Other Points in Menu Making. Plan menus early enough to secure the needed supplies without hurrying the cook or the tradesman. Menus should be made at least a day ahead; a week is better. One can always modify the selection of foods to suit the supplies on hand or to provide for unexpected guests.

Pleasing Combinations. A menu may be well balanced, and still be unappetizing. The body does not get the most out of food unless it is well digested, and good digestion depends very largely on the palatability of the food. Some foods blend well together; others do not. Broiled chicken and green peas are an appetizing combination but green peas with pork are not attractive. With a food so rich in fat as pork, acid such as apple sauce, tomatoes, or turnips with vinegar is desired. Do not serve more than one starchy vegetable at a meal. Do not serve too many green vegetables at one meal—never more than two and a salad. Do not have at one meal several foods dressed or served in the same way; if one dish has a sauce, another should be dry. Do not use the same food twice in a menu; for example, cooked tomatoes and tomato salad; or chicken broth followed by chicken for the meat course. The only exceptions to this rule are the use of fish and oysters at the same meal, or a soup made from beef stock with beef in some other form. In planning the dessert be sure that it does not disturb the balance or proportion of the ration.

Giving Variety to the Menu. By using different methods of cooking and seasoning a pleasing variety may be secured. Serving even a staple food like potatoes in the same way every day causes one to tire of it. Plain mashed potatoes, browned mashed potatoes, potatoes with parsley and melted butter, baked potatoes, and puffed potatoes, are all easy to prepare. Using a number of flavors and seasonings is another way of securing

variety. Some cooks make the mistake of limiting their seasonings to pepper and salt, with the occasional use of lemon and vanilla for the sweet dishes. Every kitchen should be supplied with a variety of herbs and spices. Of the aromatic condiments, cloves, cinnamon, allspice, nutmeg, mace, vanilla, lemon, sage, thyme, parsley, and bay leaf (used in moderation) are very useful. The peppers cause congestion in the digestive tract and irritate the kidneys and should be used very sparingly. The mild red peppers such as paprika are least harmful. Mustard, horseradish, onion, and garlic are all used as condiments but except in very small quantities are irritating. Vinegar and lemon juice in small quantities are pleasing stimulants to the appetite. Vinegar is often flavored with herbs; tarragon vinegar has a very agreeable flavor.

Time and Method of Cooking. In planning the menu consider carefully the time required for preparation and cooking; if the housekeeper is very busy she should select foods that will not demand too much of her attention. Cook foods requiring long continued heat at a time when the wood or coal range is being used, or put them in a fireless cooker. If the gas oven is to be used select the food which will necessitate the use of as few top burners as possible.

Cost. The money to be expended on food should be definitely decided. If expensive foods are bought for one day, something cheaper must be used on some other occasion; otherwise the food allowance of the housekeeper's budget will be exceeded. After the menu is made, one may substitute a cheaper article of the same class to reduce the cost; for instance, cole slaw or a jellied vegetable relish may be substituted for hothouse cucumbers to serve with fish.

Some Menus for Comparison. Each of the following dinner menus was served to four people at a total cost of seventy-five cents. Which is the better balanced? Which is more satisfying? What cheaper vegetable could be substituted for asparagus? What starchy vegetable could be substituted for potatoes? How would the cost be affected?

1. Broiled fish, scalloped tomatoes, baked potatoes, Parker House rolls, grape fruit salad, rounds of plain cake with half a canned peach, and coffee.

2. Broiled meat cakes, asparagus on toast, hot biscuit, cake and coffee.

What fault is there in the following menu? Beef soup with croutons, roast beef, baked potatoes, macaroni with cheese and tomatoes, steamed pudding with hard sauce. Suggest some changes that would improve it.

Which of the following menus is the better balanced? Shredded wheat biscuit with cream, eggs, toast, butter, dried figs, and coffee, or oatmeal with milk, eggs, rolls and butter, sweet oranges, and coffee? (If orange or other slightly acid fruit is used, it is more digestible if served after a meal.)

The first of the preceding menus is a little higher in fat, but by using milk this could be corrected. Which has the higher food value, oranges or dried figs? In using either of these menus for a family of varying ages each person might select what suited his needs. A middle aged man who wished to restrict his protein might take two helpings of cereal and omit the egg; the housekeeper might do the same; or either might take cereal one day and egg and toast the next. The growing children might eat everything in the menu. Either of these menus with the following luncheon and dinner forms a fairly well balanced ration if only caloric value is considered; but except for very active people in a cool climate they would prove too rich in carbohydrates, and might cause digestive troubles:

Luncheon: Bean soup and croutons, cole slaw, rice pudding.

Dinner: Clear soup, mutton, rice, carrots, steamed pudding with hard sauce.

Common Mistakes in Menus. Some people, particularly women, live largely on starchy foods. They eat white bread and sweets, and drink much tea, or they use quantities of rich pastry and much highly seasoned food. This is bad for the teeth and also disturbs digestion. Some do not eat enough fruit and green vegetables. Many men of middle age consume too much meat. Avoid these errors in making menus. Be sure to use plenty of green vegetables and fruits; this will prevent the eating of too much of the more solid foods.

WRITING MENUS

The following forms for simple menus will serve as convenient models:

BREAKFAST

Fruit
Cereal
Meat or eggs — Bread
Beverage

LUNCHEON

Hot dish — Bread
Salad or Fruit
Beverage

DINNER

Soup
Meat or Meat Substitute
Starchy vegetables — Green vegetables
Bread
Salad
Dessert
Coffee

QUESTIONS AND PROBLEMS

What are the fuel requirements per pound of body weight of the average man? How many calories does he need in twenty-four hours? How many does a woman need? How many do you need? What proportion of the food should be protein? What factors influence one's food requirements? Why are coarse foods needed? Compare summer and winter vegetables, for example, the tomato and the turnip, as to caloric value.

How long before they are needed should supplies be ordered? How may variety be secured?

Write a well balanced menu for breakfast, dinner, and luncheon or supper for your family, considering age, occupation, season, cost, and time for preparation. Write a menu for dinner combining the same factors where guests are present. Write a hot weather menu; one for cold weather. Plan a family breakfast for five cents for each person. For eight cents. Make a list of the supplies needed for these meals. Can fruit be provided at these prices? Write the order of work for preparing the breakfast. Make careful note of the fuel that will be used. Set the table for the breakfast, arranging it as far as possible so that no one need leave the table to serve. Write a menu suitable for a farmer; for a bookkeeper. Write menus for a day, suitable for a family of two adults and three children under twelve years, to cost one dollar. Write a menu for a Sunday dinner that could be prepared largely beforehand so that the housekeeper could attend church. Write a well balanced menu from supplies produced in your locality. Write a menu in which most of the food could be prepared in the fireless cooker; one using the steamer. Write a menu for a company luncheon to cost twenty-five cents for each person; one to cost fifty cents. Write a detailed plan for the first of these menus, including marketing list; schedule for preparing meal (referring to recipes needed); decorations; linen, china, and silver required in serving; and directions for waitress in serving.

MENUS FOR SPECIAL OCCASIONS

For special occasions one need not be so particular about the proper proportion of each food, although it is always well to consider health. A very rich sweet ice cream with a rich cake should not be used as no hostess wishes her guests to be ill after eating the meal she serves.

A pleasing color scheme is attractive, but should not be secured by the use of artificial colorings of food. The red of apples, peppers, and tomatoes, the golden hue of cake and rolls, the brown of chocolate, and the brown and cream of candies all are useful. A flower of the desired hue may be placed on each plate.

The Floral Decorations. Flowers add to the beauty and enjoyment of any social occasion; expensive hothouse varieties, however, are no more beautiful than many wild or garden flowers and fruit blossoms. Such humble flowers as petunias or phlox daintily arranged with a bit of fern are very attractive. The corn flower is one of the few blue flowers to be had, hence

it is very useful for patriotic occasions. In the spring, fruit blossoms and in the autumn berries and bright leaves and vines are most appropriate. If the housekeeper has even a small yard she may always have some flowers except during the winter. A small window garden will afford some blossoms even at Christmas; the bulbs are most satisfactory for winter and early spring.

Flowers are not always needed for decoration. At Thanksgiving fruit and autumn leaves seem more appropriate; for Christmas, holly, mistletoe, or any other attractive green shrubs are more suitable than cut flowers. A sparkling tree or a Santa Claus makes an attractive centerpiece.

The following special menus will suggest some pleasing combinations and color schemes:

Washington's Birthday. Colors, red, white, and blue. Use old blue china, bread and butter rolls tied with red (or red, white and blue ribbon); chicken salad, molded in tomato aspic; small frosted cakes with a cherry on top; lemonade, punch, or coffee.

Valentine Party. I. Frosted heart shaped cakes; fruit punch.

II. Heart shaped chicken sandwiches garnished with olives; sherbet and heart shaped frosted cakes.

Fourth of July. Chicken sandwiches, made of white bread cut in rounds; salad of stuffed tomatoes, served on blue plates; brick ice cream in white plates with tiny flags on each plate.

Hallowe'en Party for Children. Minced chicken sandwiches; gingerbread; lemonade; peanut brittle.

Gold and White Ice Course. (Gold rimmed china.)

I. Caramel ice cream; frosted angel cake; a yellow rose or daisy on each plate.

II. Vanilla cream; unfrosted sponge cake.

III. Sherbet in orange baskets and white cake.

Red, White, and Green Color Scheme for Afternoon Party. Use a salad of green peas with Mayonnaise on lettuce leaf; round sandwich of white bread with filling of cheese and nuts. A bit of bread is removed from one side of the sandwich and a thin crosswise slice of olive stuffed with pimento is laid in so that its surface is just even with the surface of the bread, thus giving the red, white, and green. Following this a white ice, lemon sherbet, or ice cream may be served in a paper case with an outside covering of green crêpe paper; a narrow red satin ribbon is tied around the case near the top; accompanying this is a small white frosted cake.

For Afternoon Tea:

I. Nut sandwiches; small cakes; coffee or tea.
II. Sweet sandwiches; hot chocolate with whipped cream.

Chafing Dish Supper:

I. Hot scrambled eggs with grated cheese, or a welsh rarebit; lettuce or tomato sandwiches; bread and butter sandwiches; olives; small cakes; tea or coffee.

II. Creamed oysters or chicken (from cold roast chicken) on toast; celery salad with French dressing; bread and butter sandwiches; small cakes; coffee or tea.

Picnic Luncheons:

I. Cold chicken (roasted, fried, or in chicken pie); bread and butter sandwiches; olives; celery salad; small cakes; fresh fruit; pecan candy; coffee.

II. Roast beef or ham sandwiches; bread and butter; stuffed eggs; whole tomatoes served with salt; fresh pineapple or peaches; cookies; lemonade.

III. Lettuce and nut sandwiches; stuffed eggs; Graham biscuits with filling of cottage cheese; fresh fruit; cookies; hot or iced tea.

IV. A menu that may be prepared in the woods—Sandwiches or bread and butter; fruit and small cakes may be brought from home; bacon or meat may be broiled over the coals on a stiff green twig; potatoes, corn, and eggs may be roasted in ashes, and coffee may be made.

SERVING FOR SPECIAL OCCASIONS

An Afternoon Reception or Tea. Unless one is able to employ a caterer it is best to choose simple dishes, simply prepared.

A tea table should be large; a round one is to be preferred. Its polished surface should be protected by handsome doilies; a low bowl of flowers should be placed in the center, although in autumn fruit and bright leaves would be appropriate. About the centerpiece arrange several shaded candles in silver or crystal holders; if the room is not darkened these will not be needed. Put on the table plates of dainty sandwiches and small cakes, and glass or silver dishes of salted nuts, mints, or other confections (if they are to be used).

If coffee and tea are both served place one service at each end of the table. Put a dish of sliced lemon and one of cut sugar on the tea tray or on the table near the teapot. Place with the coffee a pitcher of hot cream, and sugar and tongs for serving (a spoon or the tips of the fingers may be used). Small flaring cups of the standard tea pattern are used for tea; after dinner coffee cups are used for coffee. Use small spoons. If a large number are to be served have the tea made in the kitchen and strained into a hot pot so that it will not grow strong with standing; even with this precaution fresh tea should be made

A CONVENIENT CHAFING DISH OUTFIT

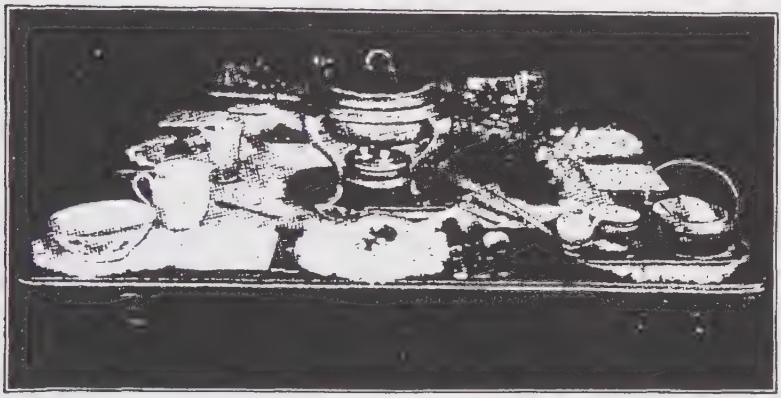
several times during a large reception, as it loses its fragrance by standing. Coffee may be made in quantity and the pot refilled, if one has no coffee urn; an electric plate may be used under the pot if the table is protected.

Chocolate, beaten and flavored, is served in the same manner as tea and coffee. Put a spoonful of whipped cream on each cup. Use a glass, silver, or china bowl and a small ladle for the cream. A chocolate service may be used, but a tall china or silver pitcher and coffee or teacups may take its place. Small cakes or sweet sandwiches may be served with chocolate; never meat or cheese or rich salad dressings, as chocolate contains much fat.

Punch alone or punch with small cakes may be served. A small table will usually suffice for punch. Arrange the glasses and the bowl and place a silver ladle in the bowl. Provide enough

glasses to give each guest a clean one. A part of the glasses may be washed while the others are in use.

A Chafing Dish Supper. The chafing dish is a most useful article, not only for the college girl but for the housekeeper. A hot dish prepared on it and served with some cold foods will make a most attractive Sunday night or other supper.



CHAFING DISH TABLE SET WITH DOILIES

Arrange the table as for afternoon tea, putting on plates of sandwiches, cold meat, and cakes. Put the chafing dish on the tray with the needed spoons or ladles in the place of the tea service. Put the plates in which the dish is to be served in front of and to the right of the tray; lay the forks or spoons beside it (knives are not usually needed). Oyster stew or hot soup may be served from the chafing dish. If coffee or tea is served, put the service before the person who is to pour it. A creamed dish on toast or crackers accompanied by a salad, sandwiches, small cakes, and a hot beverage makes a pleasing supper.

The Picnic Luncheon. (See Sandwiches, page 220, and The School Luncheon, page 316.) In planning a picnic menu, remember that if full benefit of the outing is to be enjoyed, the food must be wisely selected and prepared in simple ways. Fried

foods, such as potato chips and doughnuts, and rich pastries, canned meats, and highly seasoned foods are no more digestible on a picnic than at home. For meats use veal, mutton, beef, or plain boiled ham, roast chicken or turkey. Chicken pie, thin slices of boiled ham with stuffed eggs lightly seasoned, baked beans, and meat sandwiches are all popular. Wrap meats and sandwiches in oiled paper.

Salads must be fresh and crisp; wrap salad plants in a damp cloth until ready to serve; it is best to carry the salad dressing in a jar having a screw top and put it on the salad when ready to serve. Carry salmon or potato salad in deep bowls covered with oiled paper.

Fresh fruit is always good on a picnic; fresh pineapple pared, pulled apart, and sprinkled lightly with sugar, then chilled before packing, will be crisp at serving time.

Cookies or small cakes, and loaf or layer cakes that can be carried without being mashed, are all good picnic foods. Some simple home-made candy may be used—peanut brittle, fudge, or divinity.

For beverages lemonade and iced or hot tea, or coffee are suitable. Tea and coffee should not be habitually used by young people, but when one is in the woods a hot beverage seems most appetizing. Carry lemon juice mixed with sugar or a syrup in jars or bottles and add the required quantity to a glass of cold water when needed. Carry strong tea in the same manner. Coffee for a small party may be carried in a thermos bottle, but the odor of coffee being made seems to give a real picnic atmosphere. Carry the coffee in a can or jar to keep the odor from other foods, and provide a cheesecloth bag for making it. (See Coffee in Quantity, page 359.) Tea should be made fresh. Take a small teakettle or saucepan for boiling water; the kettle is best. Do not forget tea and coffee pots if needed. One is usually thirsty when outdoors, hence an abundance of the selected beverage should be provided.

Butter should be carried in a can or screw-top jar. A small quantity may be put in a jelly glass wrapped in a wet cloth.

Carry sugar and salt in tightly covered jars or cans. Cheese, olives, and pickles also should be put in jars.

The Dishes. Use sterilized pasteboard or wooden plates. Provide plates, cups or glasses, spoons, knives and forks (if needed) for each person. Take a paper tablecloth or an old linen one, and paper napkins.

Dishes Prepared Out of Doors. In camp cookery, a good bed of coals, not so large that the heat is too great, is essential to success. Meat may be broiled on a strong green twig over the coals. Eggs, potatoes, and unhusked corn may be roasted in the hot ashes with a few coals on top. Remember that the time and temperature for cooking these foods are the same whether out or indoors. Bread may be baked in a Dutch oven or on a hot stone, although the last is a tiresome process. Some most appetizing stews of meat or vegetables may be made.

QUESTIONS AND PROBLEMS

Plan the refreshments for a Valentine party. Estimate the cost. Plan an ice course, using a seasonable color scheme. Prepare and serve afternoon tea for the faculty, limiting the cost to ten cents per guest. What simple and inexpensive floral decorations are available in your town at the different seasons? What wild flowers are suitable? How much will the decorations cost for any of the entertainments you have planned? Plan a chafing dish Sunday supper for your family. What is the cost of a chafing dish? What fuel do you use for it? How much does it cost to prepare supper with it? Write a menu that could be prepared and served in the woods.

CHAPTER XXII

HOUSEHOLD MANAGEMENT

THE PART OF THE HOUSEKEEPER

The woman who is a capable household manager is a great factor in the economics of the nation, because the prosperity and happiness of our country depend on each home. Women have charge of the spending of most of the money gained by the wage earners. The word "economy" means the careful use of materials. Do not be extravagant with time or strength any more than with money. Make a schedule dividing your labor and time so as to give you the most leisure. Does the housekeeper do any work that is of financial value, in managing the home? Which would be the greater benefit to your family, to get an increase of one hundred dollars a year in income or to save the same amount by wise management?

In the chapters on cooking, instruction has been given in judging supplies and materials; in the study of the home the social and hygienic aspects of shelter have been discussed; with these standards established, the housekeeper has to decide how she will apportion her money so as to satisfy best the needs of her family.

THE BUDGET

The first question to settle in spending a sum of money is to determine into how many portions it shall be divided. The second point is to decide what proportion shall be spent for each division of the budget. There are certain expenses that are common in all families as food, shelter, and operating expenses (that is, service, laundry, fuel, lights, etc.), clothing, and higher life (church, charity, education, travel, amusements, investment such as life insurance, and the buying of property). Medical

attendance, drugs, car fare, and other sundries may also be put under the head of operating expenses.

Food. The amount of money spent under each head will depend on the amount of the income, the number in the family, and the style or standard of living. If the income is small a very large percentage of it must be spent for food; a laborer working for one dollar and fifty cents per day would spend fifty per cent or more for food, while a family whose income was about three thousand dollars per year would not spend more than thirty per cent for food. What part of the income is spent for food in your family? Put the sum under the head of "food" in the budget. (See page 295.)

Shelter. Shelter, like food, varies; but with a small income, food and shelter take almost the entire income, leaving but little for clothing. What does the day laborer in your town pay for shelter? What comforts does he receive for this sum? What is required for healthful housing? If you live in your own home, estimate the interest on the sum of money invested in your home. Add to it insurance, taxes, and water rates, and whatever expenses are made in keeping the property in good condition. Consider this amount your cost of shelter and enter it under the head of "shelter" in the budget. If you own your home, the interest on the investment in it should be added to your income before you find the percentage of the total income which goes for the various items of the budget.

Operating Expenses. For the small income this item will be very little. What do you spend for this? Put the amount in the budget. How does keeping a helper increase the expenses, in addition to the wages? Could you live in a smaller house if you did all your own work? How much house rent could you save? On the other hand, is it economy for a woman who is not strong to do heavy work and save on service if the effort causes her to spend money for medical treatment? What other expenses besides service come under the head of operating expenses? Could they be reduced? In what way? Could a saving on light be made? How?

Clothing. Under this head, list all purchases of dry goods, whether they are for personal or household use; the amount spent will depend on income, climate, social requirements, good sense, and good taste, and on the care with which we use our clothing. Every person should be dressed comfortably. In a warm climate this is not expensive; where there is much cold the cost is heavy. One's business or profession calls for the proper dress. A doctor must spend more than a carpenter for his clothes; the housekeeper will not need to spend as much for clothes as the teacher, who must dress well every day. Good taste in dress is a real economy; much of the money wasted on clothes is spent by those who do not stop to think whether the garment selected is what is needed. Do you take good care of your clothes? How much do you spend for clothing? How much does your family spend? Enter the amount in your budget.

The Higher Life. The next item in the budget is the "higher life." Everyone must have food, clothing, and shelter in some form, and in a measure those things which satisfy the desire for something more than the merely animal comforts. The very poor must depend on the free entertainments and concerts, with an occasional visit to the moving picture theater; the wealthy have many items to enter under this head. For the average income the amount spent in this way depends very largely on the self-control and good management shown in the expenditures for food, clothing, and shelter. If one who is not wealthy prefers luxurious eating, elaborate clothing, or an expensive house, to books, pictures, travel, education, or charity, he must sacrifice on these things.

Saving or investment is an item that should appear in every budget, no matter how small the income, except when illness or other temporary stress makes saving impossible. Thrift has been well defined as, "The managing of one's affairs in such a manner as to increase his possessions." Money and land, however, are not the only forms of investment. A good education is a permanent investment. Be thrifty, but not miserly. What does your family spend on higher life? Enter this in your budget.

FORM FOR FAMILY BUDGET

Fill out this form with your budget figures.

Number in Family....(Children....Adults). Income.....

Food
Shelter
Operating Expenses
Clothing
Higher Life

HOUSEHOLD ACCOUNTS

Rule two sheets of tablet paper as indicated on pages 388, 389, and keep one month's accounts on them. Then copy neatly into blanks of the pages indicated.

The portion of an annual budget that will be spent in any one month will depend on the season. If coal is purchased in quantity the whole year's fuel allowance may be spent in one month. Winter clothing, too, may be bought all at once.

Put the source of the money received in the article column, entering it as allowance, salary, wages, rent, or income on other investments. Put the name of each article purchased in this column. Then put its cost down in "charged," or "cash expended," according to the method of purchase. Enter its cost under "total expended," and finally put the cost under its proper head, "food" or "shelter," etc. When the page is full add each column and put the totals at the bottom. If it is not the end of the month carry these totals forward to the top line across the next page. At the end of the month the totals are put in their proper line at the bottom.

Charge Accounts. A separate column is used for charged accounts because this is the danger point in many families. If these are kept low, money may be saved. When a charged account is paid, enter it on the right in its proper column.

To Find the Financial Condition. To find one's financial condition at any time get the difference between the total expenses and the money received. For example, if there is forty dollars under "charged" and sixty dollars under "cash expended," the total expenditure equals one hundred dollars. If

only ninety dollars has been received there is a debt of ten dollars. If one hundred and fifty has been received there is a cash balance of fifty dollars.

MARKETING

The term marketing includes not only the purchase of such supplies as meat and vegetables, but also the staple articles used in every kitchen. In order to judge them the housekeeper must know the qualities of good articles of the same class. (Review standards of food selection given in chapters on food.)

Do not depend on the telephone for marketing, as many stores sell inferior goods to those who buy in this way. Select food just as carefully as you do hats. Visit the grocer's often, and go to the market for meat and vegetables.

PURE FOODS

(See State Pure Food Laws)

Foods are said to be adulterated if they contain any substitute for the substance of which they are supposed to be composed; or if any part of the food has been removed; or if it is colored or coated; or if any poisonous or harmful ingredient has been added. Food is adulterated, usually, to make it cheaper for the manufacturer and to give him a greater profit than he could make on pure food. Adulterants may or may not be harmful. A quantity of starch and water in sausage may not cause acute illness, but if such sausage is depended upon for the proper allowance of tissue building food the consumer will be underfed.

Compounds or mixtures are lawful, but the label must state the fact that they are compounds or mixtures; for example, maple syrup made of cane and maple syrup is not harmful, but it is cheaper to make than pure maple syrup, and if the label does not state that it is a compound the purchaser may pay a maple syrup price for it.

In order to secure pure food one must be very careful to study the labels on all package foods; if they are bleached or colored with any harmful substances do not buy them. Our laws allow certain mineral colors and preservatives, but if foods can be

secured without these articles it will be safer to use them. Do not use foods which contain salicylic, boric, or benzoic acids, or benzoate of soda. Clean food, carefully put up, does not require these preservatives. In some states any suspicious articles of food may be sent to the public health officers for investigation.

Secure samples of as many kinds of commercial jellies, jams, pickles, baking powders, and other package foods as possible. Study the labels. Read that part of the pure food law that deals with this subject. Are they correctly labeled? Make a list of them. State whether pure or compound. Compare the prices. How many are bleached? How many contain mineral preservatives? How many are colored? What is a jam, according to the pure food law? A jelly? A syrup? Extract of vanilla? Of lemon? When is candy said to be adulterated? Is it legal to sell tomato catsup containing mold spores? What chemical colors and preservatives does your law allow?

Food in Packages. In cold weather one may be able to purchase cereals, rice, macaroni, and dried fruits in bulk in good condition, although they often contain much dirt unless they have been carefully stored. In warm weather or in warm climates package goods are usually more satisfactory than bulk goods. In any purchase the condition of the article must be considered as well as the price. Note directions for care of food products, given on packages. Review care of supplies in food chapters.

Buying in Quantity. For a large family with room for storage it is cheapest to buy supplies in quantity, but for the small family only certain articles can be bought to advantage in this way. For example: laundry soap, starch, canned fruits, and vegetables can be purchased in the autumn when the supply is fresh; sugar, green coffee, and ice-cream salt are articles that may be kept without loss; but tea, baking powder, roasted coffee, potatoes, flavoring extract in large bottles, dried fruit, desiccated cocoanut, cereals, and flour all deteriorate if kept long.

Staple supplies should be purchased for a month; others that

are not very perishable for a week. Keep the pantry well stocked with flavorings, seasonings, and such canned goods as are needed for regular use or for unexpected guests, or other emergencies.

Real Saving. There is, however, even for the small family a real saving in careful buying. For example, if certain package or other goods are offered for fifteen cents per package or two for twenty-five cents, buy two if they can be used. The two and one-half cents saved on each package may seem a small saving, but in terms of per cent it amounts to sixteen and two-thirds per cent, or one-sixth of the whole. A penny saved is a penny earned, and when it is done by careful buying it is far more easily earned than if some sacrifice is made to save it. In buying canned goods a reduction is often secured by taking a dozen cans or a case at a time. Frequently a whole basket of fresh fruits and vegetables such as peaches and tomatoes can be purchased for little more than the price of a small quantity. If a whole basket is more than is needed for immediate use, one can preserve the surplus by cooking or canning it.

QUESTIONS AND PROBLEMS

Tell how to judge beef; veal; mutton; pork; chicken; and fish. What proportion of a good soup bone should be flesh? Bone? Which should be chosen for a small family—loin or porterhouse steak? How could the tough ends be utilized? Tell how to select cereals. Why not buy cornmeal in quantity? Tell how to judge potatoes, beets, turnips, squash, egg plant, cabbage, cauliflower. Inspect your supplies and make a list of the staple articles needed for a month. See what perishable foods would be needed for a week. Make a list of the supplies that you will purchase at the grocery; one for the market. If your mother is willing, order the supplies for your family, first inspecting everything carefully. Visit a first class grocery store; take a book and note prices. Visit another grocery and note how the prices compare. Make a list of goods offered that you could use at home. Did you get any suggestions for varying your menus? Visit the meat and vegetable markets in the same way. Make a menu of a definite cost to be prepared at school. See what supplies are in the pantry. Make a list of what you must purchase. Review standards for judging articles that you need. Buy them in good time for the lesson.

Inspect your grocery. Note cleanliness, ventilation, food containers;

whether mouse, insect, and dust proof; refrigerator; care of perishable foods; method of handling foods eaten raw; health of employees; method of delivery. After a careful inspection fill out the following card:

SCORE CARD FOR THE GROCERY STORE

	Per Cent	To be filled by pupil
I. General sanitation		
1 Location in the city 5		
2 Environment		
(a) Proximity to stables, undesirable dwellings, etc.		
(b) Back yard, manure, litter, empty cans and boxes, decaying fruits, vegetables 10	30	
(c) Dusty streets—open fruit		
(d) Condition of side walks		
3 Basement or back room 5		
4 Lighting 5		
5 Ventilation 5		
II. Equipment and Management		
1 Refrigerators 8		
2 Covered counters 3		
3 Proper shelving 3		
4 Floors 3		
5 Weights and measures 3		
6 Screens—broken (?) 3	50	
7 Places for molasses, oils, etc 3		
8 Personal cleanliness of employees 8		
9 Exclusion of flies, rats, and mice 8		
10 Handling goods with the hands 8		
III. Delivery		
1 Promptness 5		
2 Properly wrapped and covered 10	20	
3 Wagons—condition 5		
Total	100	

A BABY WHO SCORED 99.82% IN A "BETTER BABIES CONTEST"

PART THREE

CARE AND FEEDING OF CHILDREN AND INVALIDS

CHAPTER I

TAKING CARE OF THE BABY

Many girls who read this book help their mothers in the care of baby brothers and sisters and will be interested in studying the needs of babies.

The baby's body, like his mind, needs training and protection, if it is to be perfect. The head is soft and the brain may be injured by hard bumps or by pressure. His skin is very tender; it has not the resistance of that of an older child or a grown person. The baby must be protected from the bites of insects, as they carry disease and their stings are very irritating to the skin; some slight irritation of this sort may cause fever in a delicate child, interrupt his growth, and lessen his strength so that he will not be able to withstand even a slight illness. The baby's face and hands must not be exposed to flies.

The baby tries to learn to use his muscles by kicking and by moving his arms and wiggling his body. After the first six weeks he may be played with a little. The mother or nurse may move his legs or arms gently; no baby should lie in his crib all the time; he gets much good exercise in his mother's arms. He should, however, be taught to lie in bed quietly a part of the time while

awake, as a child that is constantly handled and talked to receives too much stimulation and becomes nervous. Each day after the first four weeks the baby should be undressed and put on a rug or bed in a warm room and allowed to kick and wriggle as he pleases. A child should not be propped up straight in a baby carriage before he is old enough to sit up, neither should he lie in the carriage with his eyes exposed directly to the sun.

Do not use a baby jumper; nature will teach the child to stand in time. The baby should be encouraged to crawl as soon as he shows a desire to do it; this develops many muscles and is good for the bowels. Provide a pen for crawling and put it around a clean canvas or sheet over the rug. A child that crawls can soon be taught to go down stairs without danger. Start him down backwards and help him until he has learned to get down without trouble. This is better than keeping the stairs barred and carrying the baby up and down. The stairs may be barred when it is not convenient to watch the baby. He should not be taught to sit or stand until he tries to do it for himself. Before this time is reached nature is not ready. After the child begins to walk encourage him to do it, but do not let him walk too rapidly; pulling a little child along by one arm faster than he should go is very bad.

Fresh air is absolutely necessary for the child; after he is a month old he should be taken outdoors every day unless the weather is very severe. In cold weather cover him warmly, as extreme cold may be fatal to a young child. Put mittens on his hands, and keep him in a spot sheltered from high winds. If protected from strong sun a baby may spend most of the day outdoors, taking his nap on a screened porch.

A baby should have cool water, given between meals from a nursing bottle, but never within half an hour of feeding time. The use of the bottle is valuable even for breast fed babies if they should require feeding during the absence or illness of the mother. Boil all water for babies under one year old. If the urine shows a brick dust sediment it is an indication of a lack of water. Water also helps in regulating the bowels.

Sleep. The baby's bedtime should come early in the evening. Regular hours are very important both for the sleep at night and the daytime nap. The late morning or mid-day is the best hour for the nap for the older baby; he will then be ready to go to sleep early at night. Up to six years of age, a child should take a nap every day.

Disturbed sleep is in most cases due to improper feeding, although uncomfortable clothing, an irritated skin, stings of insects, or a room that is too warm or too cold will cause sleeplessness. *Never give a baby soothing syrups or other sleeping medicine. They all contain habit forming drugs that are likely to injure mind and body.* A baby should always have its clothing changed for the night, and in warm weather a sponge bath just before going to bed will be soothing.

A child should sleep alone; a crib with one side let down may be pushed close to the side of the bed of the mother or nurse. In cold weather a flannel covered hot water bag should be put in the crib; refill it during the night if the cold is extreme.

During the daytime nap cover the crib or baby carriage with a stiff mosquito bar unless the house is well screened.

Clothing. Clothing should be light and loose so that the body can move freely. In a cold climate about three layers of clothing, two of wool and one of cotton, are needed; in a warm climate less is required, but all young babies require a garment of thin silk and wool next to the skin, except in the hottest weather. A long sleeved knitted shirt of silk and wool, pinned to the diaper—which should be of fine soft birdseye—forms the first layer. A band is used for very young babies, or a single garment about a yard long may be put on instead of the shirt. Over this may be drawn a soft muslin dress and over it a flannel coat or dress. If one prefers the shirt, a flannel skirt with cotton waist and muslin dress with a short flannel sack can be used. Knitted stockings may be fastened to the diaper. No tight bands should be used about the body; they compress the ribs and may cause a rupture or break of the abdominal wall.

A child in short clothes should wear full length stockings. Shoes must be broad and very soft; they should fit loosely about the ankles and instep, but leave room for the toes both in width and length. A baby's foot grows very rapidly and when shoes are outgrown they should be discarded.

If the air becomes cooler put on extra clothing, being sure that it is soft and not tight. If the air grows warmer lighten the clothing.

Giving the Baby a Bath. Perfect cleanliness is the only way to prevent chafing. Little soap should be used; a fine white castile soap is best, but it must be washed off very thoroughly.

For bathing, use water that is slightly warm, that is, about 99° F. for the first few months, reducing gradually to about 90° F. at six months and 80° F. at one year. Bathe the baby about half way between meals; a morning hour is usually the best. Have the room and clothing warm. A very young baby must have oil baths only; one a little older may be bathed in water in a small tub or a basin. A trained nurse can show how it is done. A baby's washrags and towels should be kept fresh and clean.

The Eyes, Ears, and Teeth. Wash the baby's eyes gently. If they seem irritated bathe with a boric acid solution (it may be obtained at a drug store). If the irritation continues consult a physician. A twist of soft muslin should be used to clean the ears. *Never use a hairpin or other metal object.* If an insect gets into a child's ear lay him on his side and fill the ear cavity with olive oil barely lukewarm. Keep the head down for several minutes, then put the finger over the ear cavity, turn the child over, remove finger quickly, and the insect will be brought out with the oil. If a child has earache consult a physician promptly; much deafness results from ear neglect in childhood.

Take good care of the first teeth and have a cavity filled promptly. If the first teeth are lost too early the shape of the mouth is injured, and the child may have indigestion on account of not being able to chew his food.

OUTLINE FOR BATHING AND DRESSING A BABY

Clothes. Before the bath the clothes are put in a warm place.

The band comes first for the young baby.

The diaper must be folded smoothly to fit. A small inside diaper of soft cheesecloth may be used and burned when soiled. When putting on the diaper see that it is loose about the body, and that it is not too thick. A tight thick one draws the hips together, presses the legs out of place, and by its heat irritates the skin. Change it as soon as it is damp or soiled, sponging the skin with a soft cloth wrung out of cool boracic acid solution, and drying well before putting on another. Diapers should be washed before being used a second time. In washing the baby's clothes rinse well to remove soap. Have the shirt of silk and wool. To put on sleeves roll in a ring and slip over wrists.

Put on flannel skirt, then dress and coat.

Bath. The nurse should put on a rubber apron, over which is pinned a large, soft bath towel. Use olive oil only until navel is healed—from 7 to 10 or 14 days.

Warm olive oil by placing glass in pan of warm water. The child is carefully oiled with the finger, care being taken to get into all skin creases and folds. The body is wiped with an old soft bath towel.

Eyes. Wash with antiseptic absorbent cotton, or a twist of soft muslin, dipped in boracic acid solution, and wipe with dry cotton.

Nostrils. Cleanse with cotton wrapped smoothly on a blunt toothpick (applicator) dipped in boracic acid solution, and dry with dry applicator.

Mouth. Clean thoroughly, not omitting the tongue. Use cotton wrapped around little finger and dipped in boracic acid solution.

Head. Wash with large cotton wad dipped in boracic acid solution, and dry with dry cotton. If a tiny yellowish crust appears, rub with vaseline, then the following morning wash with warm water and pure castile soap; continue this until the head is perfectly clean. Brush the hair with a soft baby brush, never using a comb.

Body. No dusting powder need be used unless chafing or a summer rash is apparent; then the formula given below will be useful.

Baby is then dressed and carefully and loosely wrapped in warm woolen blanket (in winter) and kept quiet.

To Bathe in a Tub. Have water a little above lukewarm and use a good castile soap. With fingers about the back of the neck and head, and right hand clasping the ankles, lower the child slowly and gently into the water, buttocks first, and let rest on the bottom of the tub, thus freeing the right hand to wash the body. The left should hold his head above the water. The baby is quickly washed, care being exercised in getting into the folds. Dry by patting gently with an old soft towel.

The head, ears, and neck are washed with a soft cloth squeezed dry of water. Powder if necessary, and put on clothes. Then cleanse eyes, nostrils, and mouth as directed.

USEFUL FORMULAS

Dusting Powder. ⅓ cornstarch, ⅓ talcum powder or boracic acid powder, ⅓ stearate of zinc powder.

Boric or Boracic Acid Solution. Boric acid dissolves in water only to four per cent, and this is the strength usually employed. Use 1 tsp. boric acid powder to 1 c. boiling water or ⅓ cup to 1 gal. of water.

QUESTIONS AND PROBLEMS

Why is a child's head soft? (See Physiology.) Why is too much handling bad for the baby? Why is crawling good for him? Give directions for securing fresh air. Why is water so important? Why give it in a nursing bottle? How much sleep should a baby have? What is the best time for the older child to have a nap? Why not use sleeping medicines?

How is a young baby bathed? When may water be used? Give outline for bathing baby. Why is clean soft clothing needed?

CHAPTER II

DIET OF THE CHILD

(Review Milk)

The results of bad feeding in early childhood show themselves in bow legs, bent spines, and teeth slow to appear or decaying early. The child whose milk teeth decay is usually suffering from malnutrition; later in life tuberculosis, goiter, and other diseases may attack the child who has been ill fed. In infancy mother's milk is the proper food for the baby; only a few artificially fed children are perfectly strong.

The Composition of the Food. The child needs each of the food elements. It requires protein in a greater amount, and has less power of digesting carbohydrates than the adult has. His ability to dispose of an excess of fat is also below that of the adult. The composition of human milk must be the guide for the adaptation of cow's milk to the child's use. Human milk has slightly less fat than cow's milk, more sugar, and far less protein. By diluting cow's milk with water the quantity of all these ingredients is lessened; then by adding malt sugar a mixture that gives us the best substitute for mother's milk is made. Malt sugar is not used before the third week in the formulas quoted below. The best authorities conclude that a normal child needs in twenty-four hours the protein contained in one and one-half ounces of good milk for each pound of body weight. The fat in milk, if it is a milk with a four per cent fat content, will be sufficient for his needs. He will require slightly more carbohydrate than the sugar of the milk will furnish, so malt sugar should be added, one ounce being sufficient. Water is then added to make the required quantity.

The Caloric Requirements. (Review Daily Fuel Value Requirements, page 43.) A child requires food to furnish forty-five calories of energy in twenty-four hours for each pound of body weight up to six months, then forty calories from six to nine months.

Amount of Food. The amount of food given depends on the age and the weight of the child. A young baby's stomach holds one ounce at birth; two and one-half ounces at one month; three and one-half ounces at two months; four and one-half ounces at three months; and six ounces at seven months. Some authorities give only as much food as the stomach holds; others a little more, believing that a part of the food passes out of the stomach as soon as eaten. Those who advocate the latter plan give a little more than one ounce at birth, with four-hour intervals; five ounces at a feeding at three months; seven ounces at six months and eight or nine at eight months.

If a child of six months, weighing fourteen pounds, is to receive five seven-ounce feedings in twenty-four hours, about thirty-six ounces of food will be required. Twenty-one of this is milk and one ounce malt sugar. To this add enough boiled water to make the required quantity—fourteen ounces of water will be needed—making in all the thirty-six ounces. As the child grows older and heavier less water is used; hence he receives a more concentrated food.

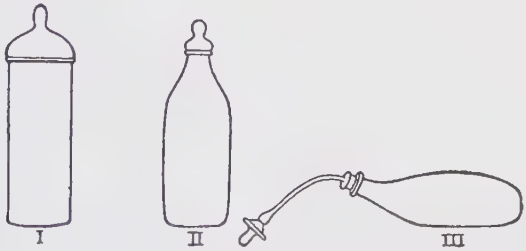
How much milk is needed by a baby weighing twelve pounds? How much water should be added to his milk? How much can he take at a feeding if he is six months old?

Intervals Between Feedings. Even a breast-fed baby will be cross if he eats too often. Many authorities think that four hours should elapse between feedings; other authorities, three hours. A child fed every two hours is almost sure to have colic or be restless. Milk does not leave the stomach for three hours, and putting in more food will cause indigestion. Those who advocate the four-hour feeding think that the stomach should have a period of rest after it is emptied. If a child seems

hungry before the next feeding give him more food at a time, but do not shorten the intervals between feeding.

Length of Time for Feeding. A child should spend about twenty minutes in taking his food; never less than ten minutes or more than twenty, whether he is breast- or bottle-fed.

The Manner of Feeding. Take the child in the arms, and hold the bottle so that no air enters the nipple. Never let a child suck from a bottle so nearly empty that the nipple is not covered with milk. Never lay the bottle on the pillow and leave the child to eat alone.



FEEDING BOTTLES. I AND II GOOD TYPES. III A DANGEROUS BOTTLE

The Time of Feeding. Babies should be fed at regular times. Where four-hour feedings are used the best hours seem to be 6 and 10 A. M., and 2 and 6 P. M., and 12 midnight. After eight or nine months change the midnight feeding to 10 P. M. so that the child may have eight hours of unbroken sleep.

PREPARATION OF FOOD

Utensils Needed. Proper utensils will lessen the labor in preparing modified milk. Uncracked granite or aluminum saucepans, double boilers, and other utensils should be used. Provide an eight-ounce glass graduated cup for measuring; a dairy thermometer; a dozen feeding bottles, with shoulder beginning at the neck (See figure); half a dozen black rubber nipples that may be turned inside out for cleaning (never use a feeding bottle with a rubber tube); non-absorbent cotton for stoppers; a pitcher for

mixing food; a tall cup for warming bottles; glass tubing for syphon, if needed; a bottle brush; bicarbonate of soda, and boric acid for cleansing the utensils.

Mixing the Food. If in any doubt about the quality of the milk, Pasteurize it. (See page 138.) Measure enough cold milk for the day; add the proper amount of malt sugar solution (See page 314) and cold boiled water; stir well and fill as many feeding bottles as are needed; cork with non-absorbent cotton, and put them in a very cold ice-box.

Warming the Food. When a bottle is needed remove the cotton, being sure that the hands are clean. Adjust a nipple from the boric acid solution and set the bottle in a deep cup of hot water until lukewarm. *Test by pouring a few drops on the back of the hand; never put the bottle to the mouth.* All milk that is left in the bottle must be thrown away. *Never attempt to keep milk warm for several hours in a thermos bottle or otherwise.* Bacteria increase rapidly when warm.

Washing Utensils. Rinse all utensils in cold water, then in hot. Wash in hot soapsuds, cleaning bottles with a brush. Reverse nipples to wash. Lay bottles, nipples, and glass tubing (if used) on a cloth in a kettle; cover with water and boil for five minutes; wipe the outside of the bottles and cork with sterilized cotton. Drop the nipples in a saturated solution of boric acid until ready to use. Discard nipples as soon as they show any cracks, as bacteria may get into the cracks. Scald the other utensils.

The following schedules* of feeding will be helpful in planning a child's diet. *Remember, however, that each child presents a separate feeding problem,* and if possible secure the advice of a feeding specialist.

EXAMPLES OF CHILD'S DIET

Baby at Birth. First 24 hours, 1 to 2 ounces of boiled water every four hours.

Remainder of first week. One and one-half to 3 oz. of food at a feeding; equal parts of milk and water.

*By courtesy of Dr. Clifford Grulee.

Baby Seven Days Old. Weight Eight Pounds. Milk, 9 oz.; water, 9 oz.; six 3-oz. feedings.

Baby Two Weeks Old. Same mixture and quantity, but add one-fourth ounce malt sugar to whole day's supply.

Baby Two Months Old. Weight Ten Pounds. Milk, 12 oz.; water, 10½ oz.; malt sugar, ¾ to 1 oz.; five feedings of 4½ oz. each.

Baby Three Months Old. Milk, 16½ oz.; water, 8½ oz.; malt sugar, 1 oz.; five feedings of 5 oz. each.

After the Child Is Weaned. When a child is weaned, or when it reaches eleven or twelve months of age, if it is artificially fed, solid or semi-solid food is added to its diet. Many people are very careful as long as a child is being bottle-fed, but as it grows older become careless, often just at a time when the problem is most difficult. The stomach troubles that attack children during their second summer are due to this carelessness.

A growing child needs a varied diet. It must be rich in protein and should contain the fresh, green fruits and vegetables that furnish the needed mineral salts for bones and teeth and prevent constipation. Fat, too, is most important. Some authorities believe that a diet too low in fat tends to deprive the body of its normal supply of calcium and magnesium salts, and is apt to lead to serious nutritional disturbances. In addition to proteins, fats, and green vegetables, a good supply of carbohydrates is needed. Too much of this should not be in the form of sugar, on account of the digestive disturbances that will follow. Milk should always form an important part of the food of any child under five, and is most valuable for older children also; *no child should take more than a quart of milk in twenty-four hours.*

As a child grows older increase the amount given at each meal, but do not feed it more frequently. An uncomfortable feeling due to indigestion causes children to fret, and older people try to comfort them by giving more food.

In preparing food for the child as for the sick only the most hygienic methods of preparation should be used.

The schedule given below will be found most satisfactory for children in their second year. Some authorities do not recommend eggs for children.

DIET FOR SECOND YEAR

6:00 A. M.—7 oz. of plain fresh milk (from the bottle if desired); do not use a very rich milk. (If using milk sugar, lime water, and barley water, reduce the barley water a little at a time until down to one ounce; then omit entirely.

9:30 or 10:00—Give a strained cereal with butter or top milk (start with a tablespoonful of cereal); after this give one-third cup of sweet orange juice, or a little fresh apple sauce rubbed through a sieve. (Always give fruits last; if given first they interfere with the digestion of starches.)

12:30 or after the morning nap serve dinner, giving first the juice from one-half pound of round steak. Every other day use a soft cooked egg seasoned with butter and salt, instead of the beef juice. Dish gravy may occasionally be substituted for the beef juice. Then give a little well cooked vegetable that has been pressed through a sieve and daintily seasoned; carrots, spinach, asparagus tops, tender string beans, young peas, and summer squash may be used. Begin with one tablespoonful and use in all two or three tablespoonfuls. A dessert is not needed, but a little soft custard, cup custard, junket, or cornstarch pudding may be given.

3:30—Give from four to seven ounces of plain milk, as in the morning.

6:00 or 6:30—Serve supper. Use rolled oats rubbed through a sieve, or cream of wheat, or well cooked mush with top milk or a little butter. *Never serve sugar on cereals.* Then put the baby to bed, and give him a bottle if he is accustomed to it.

FEEDING AN OLDER CHILD

Even after the second year children should be carefully fed; they should be fed five times a day until they are four or five years old, a small meal being given in the middle of the morning and afternoon.

Fried foods, pastries, condiments, pickles, preserves, canned meats and fish, pork and sausage, cheap candies, coarse vegetables, unripe or overripe fruits, stimulants, foods treated with preservatives or colors, and half cooked starches, whether in the form of griddle cakes or cereals should not be given to young children.

QUESTIONS AND PROBLEMS

What is the result of bad feeding in childhood? What is the best food for infants? What is the best substitute for mother's milk? How does cow's milk differ from human milk? What is added to make it more like human milk in composition? What is the standard protein requirement for babies for twenty-four hours? What are the caloric requirements of a child up to six months old? From six to nine? What are the daily caloric requirements of a child six months old weighing fifteen pounds? Compare this with that of a man weighing one hundred and fifty-four pounds at light work. (See page 279.) How many ounces of milk would the child need? How much food can he take at a feeding? How much water should be added? How much malt sugar? How many ounces in the whole mixture? How many feedings should be given? At what hours should the food be given? How often should the child be fed? How long should he spend in taking his food? Why is the manner of holding the baby so important? What are the best hours for feeding for children under eight months old? Why is regularity so important?

Make a list of utensils needed for feeding a baby. Estimate the cost. Describe the best type of nipple. Give method of preparing malt sugar. (See Recipe.) How should milk be warmed? How tested for proper temperature? What would cost least for heating the baby's milk, gas, alcohol, or electricity? Could hot water be kept in the fireless cooker for use when needed? What methods of heating baby food are available in your locality? Why not keep the baby's milk warm in a thermos bottle from one feeding to another? Why not keep the milk left in the bottle after a feeding? Give rules for cleansing and caring for utensils.

What food is given to a baby for the first twenty-four hours? (See page 310.) For the remainder of the week? Why must children be carefully fed during the second year? What food is needed? How can vegetables and fruit be prepared so as to cause no digestive trouble? How much milk may be given in a day? How many ounces in a quart of milk? If a child does not care for plain milk, in what form could it be prepared so that he would take it? How many meals does the child receive according to the schedule? Why not feed him between meals? When should water be given? How often should older children be fed? What foods are forbidden for them? If a child eats much sugar, candy, or other sweets how is his appetite affected for the other plain but needed foods? If a child's first teeth are very poor what was the probable cause? How could he be fed to make the second teeth better? Why are cold luncheons objectionable?

RECIPES

Malt Sugar

Allow one ounce of boiling water for each ounce of malt sugar. Dissolve the sugar in the water and boil for five minutes, then add enough boiled water to equal the original amount of water. Strain into a sterilized bottle, cork tightly, and keep on ice. Enough for two or three days may be made at once. (Explanation—Nine ounces of malt sugar and nine ounces of water may be reduced to less than nine ounces by boiling; then water enough is added to make nine ounces. One ounce of the solution will contain one ounce of malt sugar.) This is a very convenient form in which to use the sugar. Malt sugar seems easier of digestion than milk sugar.

Fat Free or Skimmed Milk

Use milk from which cream was obtained in the previous recipe, drawing off lower one-third with a syphon, or use milk from separator. Milk without fat is often used for children recovering from summer complaint or loose bowels.

Barley Water

Wash a tablespoonful of pearl barley. Cover with one quart of cold water. Cook gently until reduced to one pint. Strain.

Flour Ball Gruel

To prepare the flour ball, tie a pint of flour closely in a square of cheesecloth so that a very tight ball is formed. Place it in hot water and boil for six hours. Remove it from the cloth, take off the outside, and grate the remainder. Dry for two hours in a very moderate oven. When thoroughly dry put in a glass jar or some receptacle that can be tightly covered.

For the gruel use one teaspoonful of the flour rubbed to a paste with two teaspoonfuls of cold water. Measure one cup of boiling water; put it into a saucepan and add one-half teaspoonful of sugar and one-eighth teaspoonful of salt. Bring to the boiling point. Then add the flour mixture. Cook for ten minutes.

Oat Jelly

Soak half a cup of coarse oatmeal in a quart of cold water over night; then cook down to a pint. Strain through a cheesecloth. Keep on ice until ready to use. It may be warmed to soften it sufficiently to mix with milk. Cracked wheat or rice may be used.

Oatmeal Gruel

(See Invalid Cookery, page 329.)

Orange Juice

Select sweet oranges; scrub well and plunge into boiling water for a moment. Squeeze and strain the juice through two thicknesses of sterilized cheesecloth. Give one teaspoonful at a time, diluting with cooled boiled water to make it palatable.

Albumin Water

Use the white of one absolutely fresh raw egg. Cut it very fine, using a knife and fork. Add one cup of cooled boiled water and a tiny pinch of salt. Shake together in a bottle. Strain through cheesecloth and keep on ice.

Dish Gravy

If roast beef is prepared with a little salt and no pepper or made gravy, the juice that flows into the dish as the meat is cut may take the place of beef juice in the child's diet. This juice must contain no burned bits of skin or fat.

Beef Juice

Select a round steak one inch thick. Remove fat, and wipe clean with a damp cloth. Broil in an ungreased pan until well seared and heated through. Lift on to a hot plate and cut into small pieces that will fit a lemon squeezer or meat press. Cut several gashes in each piece so that the juice will be more easily extracted. Have ready a hot cup, press the juice into it, and serve at once. If the juice is not warm enough place the cup in a vessel of hot water for a few moments, but do not allow it to become hot enough to coagulate the albumin of the juice.

Peptonized Milk

Peptonized milk is sometimes ordered for weak babies. Use the commercial tablets or use fifteen grains of bicarbonate of soda and five grains of pancreatine to a pint of milk and water. Dissolve the tablet or drugs in one-half cup of cool boiled water. Put it in the upper part of a double boiler with one and one-half cups of milk and have the water in the lower vessel at about 115° F. Keep the mixture over it for about five minutes, then cool and keep on ice. To peptonize entirely let stand over the hot water for twenty minutes. If it is to be kept for some time heat to the boiling point to stop peptonization. Make only a little at a time, as it becomes bitter.

THE SCHOOL LUNCHEON

Knowing the needs of the growing body, the student could point out many errors in his own diet or in that of his schoolmates. Some of the most glaring faults are in the use of much cake and pastry; often these are purchased from venders who sell the poorest quality.

The Cold Luncheon. If the cold luncheon is a necessity let it be appetizing, nourishing, and digestible. Use chicken, turkey, beef, mutton, or egg, and occasionally minced ham for sandwiches. (See Sandwiches.) Lettuce or celery sandwiches become wilted before they are used. Sandwiches of chopped nuts and raisins or dates may be used for older children. Fresh tomatoes cut when they are eaten are very appetizing. With the meats a home-made sweet pickle is allowable. Stuffed eggs instead of a meat sandwich may form the protein ration. A cup custard is nourishing and appetizing. For little children a small bottle of milk is very good.

Besides two or more substantial sandwiches the lunch basket should contain some pleasing but simple sweet, such as a little home-made candy, plain cookies, or sugared popcorn prepared at home. Children are tempted to exchange the carefully prepared luncheon for some indigestible sweet and it is well to put up some of the least harmful of these childish delights.

Fresh, if possible, and if not, dried fruit should be found in every lunch basket. Mellow apples are particularly desirable. Of the dried fruits, figs and dates are popular; while prunes washed and slightly soaked, then stuffed with whole or ground nuts, will be very much enjoyed, or they may be used without stuffing. Omit nuts for very little children.

Putting Up the Luncheon. (See Sandwiches, also Picnic Menus.) A lunch box or basket is the most convenient receptacle for the luncheon, if the pupil is willing to carry it home; if not a clean paper bag will do. They may be bought very cheaply by the hundred. If a tin pail is used it should have a few tiny perforations near the bottom and in the lid so that air may circulate.

Provide paraffin paper for wrapping the food and paper napkins for lining the basket and for the use of the child when eating.

Make everything as dainty as possible. Wrap each egg, sandwich, or other piece of food neatly in paraffin paper. Provide salt shakers, a spoon or fork, if needed, and a drinking cup for each child.

The Hot Luncheon at School. Tests in various parts of the country have proved that a warm and nutritious luncheon served at school has been of great value to the pupils, improving them physically as well as improving the quality of their mental work. If the lunch room facilities are limited, only one warm dish may be served and this may be supplemented by food brought from home or prepared at school.

In some small districts the children might bring the materials for the hot dish from home. Among the desirable hot dishes are soups with vegetables, hot meat sandwiches, stew of meat and potatoes or rice, chicken with rice, macaroni and cheese, baked beans, and cocoa made with milk.

In a city or large school a special lunch room is to be preferred and should be under expert management; it is usually self-supporting.

The following menus are practical and popular:

Macaroni with grated cheese and white sauce, bread and butter and baked apples.

Irish stew, bread and butter, sweet sandwiches, fruit—apples or bananas.

Beef soup with vegetables, ham sandwiches, baked or raw apples.

Cream of potato soup, beef sandwiches, fresh fruit or cookies.

Beef sandwiches, sweet sandwiches, cocoa.

The Serving of the Luncheon. Whether the luncheon be hot or cold it should be daintily served, in a clean place, and with the children comfortably seated. The luncheon hour should be a social occasion and the laws of good breeding should be observed just as carefully as in the home dining room.

QUESTIONS AND PROBLEMS

What are the food requirements of growing children? What are some of the common mistakes in the school child's diet? What food should be forbidden? Why? Write down your daily menus for a week, including your school luncheon. Compare your menu with your food requirements. What is lacking? How could the defect be remedied? If there is no way of improving the school luncheon, plan a breakfast and supper that would balance your diet. Should a young child eat at the morning recess, or between noon and the evening meal? Compare the daily menu of any young school child you know with his bodily requirements. What does he eat after school? Is his daily food ration a good one? What are its defects?

Could a luncheon be served in your school? If in the rural districts could the pupils bring supplies for an appetizing hot dish? Would it be possible for a small group of pupils to prepare soup or other hot dish each day? How could the work be arranged so that no pupil would be engaged in this work more than once a week? If you have a lunch room in your school note the most popular dishes. How could the pupils be influenced to a good selection of food? Could the school sell fruit cheaper than the peddlers? Why? Prepare and put up a good cold school luncheon. Compare this with the average school luncheon, considering time and cost, digestibility, food value, and appearance. Write a menu for a hot school luncheon; prepare and serve it to a group of pupils if time permits; note cost per pupil and time required for preparation. What can you say of the manner in which luncheon is served and eaten in your school? How could luncheon time be made a time of social training. Could you have a discussion of the value of correct social usages in your class?

CHAPTER III

HOME NURSING

THE CARE OF THE SICK

Only a few people can afford a trained nurse except in serious emergencies, but the comfort or even the recovery of a sick person depends very much on skillful nursing. Much can be learned by study and practice, particularly if one observes a trained nurse at work whenever there is an opportunity.

Room and Furnishings. In selecting a room for the sick choose one that has plenty of fresh air and sunshine; one with a southern exposure is best in most parts of the country. It should be as far as possible from the noises of the street and of the household, and should be free from the odors of the kitchen. A room on the upper floor is better than one downstairs. Take out all heavy rugs and draperies; the more furniture in a room the less space for air. Draperies and rugs catch dust and germs. Make the room attractive with well-adjusted shades and short, washable curtains, clean, white covers for the tables, and small rugs that can be easily removed for cleaning. Keep a few bright flowers of delicate odor in the room in day time, changing the water every day.

A plain metal bed in single or three-quarter width is best; it is almost impossible to keep the sheet of a wider bed tight enough to prevent wrinkles. The bed should be about twenty-five inches high; if it is not high enough, it may be raised on blocks of wood, hollowed out about two inches at the top to fit the legs. This height makes it easy to handle the patient. Have the bed far enough from the wall to be reached from both sides. Select a firm, comfortable mattress; one made of hair is best. Use

light, warm, single blankets and soft, smooth sheets and pillow cases.

It is best to have the light come from the head of the bed so that it will not disturb the patient. Do not keep the room dark, but protect the eyes of the patient from any strong light. Cover the head of a metal bed with a sheet if there is a draft.

Provide two tables, one of a convenient height near the bedside, the other for the use of the doctor and the nurse.

In cleaning the room follow the directions given for housecleaning. Wipe floors and woodwork with an oiled cloth. Raise no dust, and work with as little noise as possible. Disinfect mops and cloths each time they are used, if the disease is infectious; use a mop wrung out of a carbolic solution.

If the nurse must sleep in the room provide a comfortable couch or cot.

Ventilate the room as directed in Household Sanitation; fresh air is even more important in sickness than in health. Except in very cold weather open the windows wide twice a day, first putting an extra blanket over the patient and protecting his head by a screen or an umbrella.

Cooling the Room. In hot close weather an electric fan is a necessity for a sick room in a crowded city; a palm leaf fan will afford some relief. Late investigations show that the depressed feeling experienced during a hot wave is due to the fact that the layer of air next to the body acts like a blanket to keep in the body heat. If the air is put in circulation the body is cooled. For delicate babies who must spend the summer in the city an electric fan is most useful. Care must be used to prevent drafts.

In hot, dry climates the sprinkling of porches and roofs will serve to cool the air. A sheet wrung from cold water may be hung in a door or window. These measures are not adapted to very damp climates because the cooling sensation depends on the possible evaporation, and if the air is very humid there can be little evaporation. In very hot weather a large piece of ice may be put near the bed where a draft will pass over it.

Making the Bed. (Review To Make a Bed, page 33.) Cover the mattress with a soft, smooth sheet, tucking it in as far as possible so that it will be very firm, and folding the corners like an envelope. (If the sheet wrinkles it may cause bed sores.) Over this lay a sheet folded lengthwise with the length across the bed (if it becomes soiled it may be removed without disturbing the patient; it is known as the draw sheet), so that it may be stretched very tight and smooth. First tuck it in on one side, then go to the other side and, beginning at the middle, tuck firmly toward the foot of bed. Begin again at the middle and tuck in toward the head of the bed. Now put on the top sheet, tucking it at the lower corners as was done at the corners of the first sheet. Then put on the blankets one at a time in the same way. Use a very light spread or a sheet for the top. If a rubber sheet is used it is put between the lower and the draw sheets. Soft, double-faced rubber is best as it is very easily cleaned.

To Change the Sheet While the Patient Is in Bed. Have everything ready before the patient is disturbed. Air and warm the sheets and pillow cases. Take off the spread and one blanket if more than one is used; fold the remaining blanket and sheet over the patient, leaving them just wide enough to cover well. This will keep the patient warm and the cover will not be in the way. Raise the mattress with one hand and slip the sheets from under it; do this on each side and at the foot and head. Work gently so as not to jar the patient. Remove the pillow and replace it with a fresh, warm one. Next change the gown, if it is to be changed. Then turn the patient to one side, facing out at one side of bed. (See picture, page 322.) Roll the lower and draw sheets neatly into a soft roll at the patient's back; now tuck in the clean lower sheet and draw sheets on one-half the bed as directed for making the bed. Roll remainder of sheets in a soft roll, open side down, close up to the patient's back. Then roll the patient very gently on to the clean sheets and remove the soiled ones. Draw the clean sheets over the other half of the bed and tuck them in closely and smoothly. Lay a clean, warm,

top sheet over the cover on the patient and over this put a fresh warmed blanket or the one removed, which has been aired; then slip out those underneath and put on another fresh blanket, if needed, and a fresh spread or sheet. Air all blankets well when not in use, and be sure that they have no unpleasant odors about them. Change the draw and top sheets twice a day, unless the patient is too weak. The sheets need not be washed every time unless soiled, but may be aired and ironed smooth and used

CHANGING THE SHEETS WITH THE PATIENT IN BED

twice. Work quietly and quickly while you are changing the sheets, and let the patient rest and be quiet afterwards.

Changing the Gown. Change the gown twice a day. Air and warm it, draw the sleeves up until each forms a narrow ring; roll the skirt up so that it can be slipped over the head easily.

Let the patient rise to a sitting position if strong enough; if not, pass the hands under the hips and slip up the soiled gown. Lift the shoulders in the same way and draw the gown over the head, at the same time raising the arms. Now slip the sleeves over the hands and then up the arms. Put the clean gown over the head and pull it down very smoothly, lifting first

the shoulders, then the hips. If one arm is injured take the sleeve off it last and put it in the clean sleeve first.

Turning the Patient. Loosen the side of the draw sheet on the side of the bed opposite that to which you wish to turn the patient; turn this half of the sheet over the patient. Grasp the sheet firmly in your hands and pull it toward you. When the patient is turned far enough (a little farther than is needed, so there will be no tendency to slip back) slip one hand under the back at the hips and pull the hip slightly back, to prevent rolling. Then rearrange the draw sheet, tucking it in tight and smooth. This is better than turning by putting the hands under the body.

To Lift the Patient to a Sitting Position. Stand at the side of the bed and bend your knees so as to bring your body almost to a level with the bed. Slip hands under the patient's shoulder and the edge of the pillow with the elbow under his head and under the pillow, and your hands under his arm pit on the other side. Let patient put his arm over your shoulder, then lift, bearing the burden on the shoulders rather than on the back. Stand firmly on both feet. *Always keep the pillow under the patient's head,* as the back of the neck is very tender and the pressure of the hands may be painful.

To Move the Patient from One Bed to Another. Make the fresh bed as directed, pinning the lower and draw sheet firmly on the sides, foot, and head with safety pins. Turn the cover back over the foot. Pin the lower sheets of the patient's bed in the same way. Put a heavy blanket under the patient. Have the fresh bed as close as possible to the patient's bed. Push the mattresses close together, then take the edge of the blanket and pull steadily until the patient is on the fresh bed. Keep patient covered all the time. Slip out the blanket and make him comfortable.

To Change the Mattress. A fresh mattress is often a great relief to the patient. Put on the lower and draw sheets and pin firmly; then put the blanket under the patient and move to one side of the bed. Draw the mattress back until his side of it is

in the middle of the bed. Have the other mattress with lower sheets firmly pinned on. Put it closely against his mattress, and draw him on to it by means of the blanket. Remove the other mattress and draw the fresh one into place. This does not excite the patient as lifting does.

Prevention of Bed Sores. Bed sores are very painful troubles that may afflict the patient during a long illness. Great care is needed to prevent them since they are due to pressure on bony parts, such as shoulder blades, heels, lower part of spine, and elbows. Wrinkles in the sheets, crumbs in the bed, or moisture that softens and irritates the skin may cause them. Make a careful search for crumbs after each meal. Keep the bed and clothing smooth and clean, rub the back every day with a mixture of equal parts of alcohol and water, and wash the parts where sores are apt to appear, or where the skin is red, twice a day with warm water and a good soap. Then rub with the alcohol solution, and dust lightly with a good talcum powder. Change the position of the invalid often and support the tender part on a small rubber air cushion with a hole in the center, over which the irritated part may rest. If the skin is very tender paint with equal parts of collodion and castor oil. If the skin becomes broken secure the services of a physician.

Bathing. Unless the doctor directs otherwise the patient should have a bath every day. Sometimes a little broth may be agreeable immediately after the bath. Never give a bath until at least an hour after eating.

Have the room warm and use water of a pleasing temperature unless otherwise directed. Get towels, soap, alcohol, and everything else ready and warm the towels. Put the patient between the folds of a soft warm blanket, having it come up to the neck. Then take off the gown and wrap the blanket around the patient. Wash the face and hands first. Use a firm gentle stroke and dry each part quickly. Then bathe the remainder of the body, uncovering only a part at a time and drying each part well. If preferred the hands may be slipped between the blankets and no portion of the body uncovered. Turn the patient but once;

bathe the front of the body first, then turn as far over as possible and wash the back, keeping it well covered, except the portion you are bathing..

Bathing Fever Patients. Use water of the temperature the doctor directs; tepid water usually is most soothing. The bath should last twenty minutes. There is little danger of taking cold in fever. Use long slow strokes, going over each part of the body several times.

The Teeth and Hair. The teeth must be cleaned often. If the invalid cannot brush them wipe the mouth carefully with a cloth on the finger wet with a mild antiseptic, cleaning teeth, roof of mouth, and tongue. Use a boric acid solution, or equal parts of listerine and water. Do not use any wash that is disagreeable to the patient.

Brush the hair twice a day, and rub the scalp gently with alcohol and water or some pleasing hair tonic.

Taking the Temperature. Get the physician or nurse to show you how to take the temperature of a patient. When buying a thermometer select one with clear figures, so that it can be read easily; the cheap ones are not satisfactory. *Before using the thermometer wash it very clean and dip in listerine.* Shake it gently down to 95°, being careful not to hit anything hard. If using it often put it in a narrow glass with enough listerine to come up over it, first putting some antiseptic cotton in the bottom. Do not take the temperature soon after the patient has been eating or drinking. When ready put the bulb under the patient's tongue, on either side, and see that the lips are kept closed; from three to five minutes will be needed, depending on the kind of thermometer used. Clean the thermometer as soon as the reading is over.

The Normal Temperature. The normal temperature of the body is from 98° to 99° F. It is apt to be highest from four to eight o'clock in the afternoon and lowest at three in the morning. This lowering of the temperature shows us that the strength is less at this hour, and that we should take special care of the sick

at this time. A temperature above normal denotes fever due to inflammation in some part of the body.

A Subnormal Temperature. A temperature below normal shows great weakness and a physician should be consulted as soon as possible. If the temperature goes as much as one degree below normal wrap the patient in blankets, put hot water bags at the feet, and give a cup of hot milk, tea, or coffee.

Giving Medicine. In giving medicine always be sure that the spoon or glass is clean. Buy a graduated medicine glass if possible. *Read the label before the medicine is poured out and again afterward. Give only as much as directed, give it on time, and prepare it exactly as directed.* Shake all liquids before measuring. Never attract the patient's attention to the medicine beforehand. Cork the bottle immediately and keep it out of sight. *Keep poisons in a locked closet.*

Poultices and Hot Applications. Poultices are used to relieve pain and to soften the tissues. Do not continue poulticing too long or the skin will be irritated. The size of the poultice depends on the ailment. For internal pain a poultice should cover a surface much larger than the seat of the pain, while for a boil or wound a small poultice just a little larger than the spot is used. Cloths wrung from hot water are used like poultices, and are considered more effective in many cases than dry heat. Follow the directions for poultices and change when the cloths begin to cool. Some of the proprietary substitutes for poultices are now widely used.

Application of Dry Heat. Use a thin bag filled with heated sand, salt, or bran; bran is the lightest. Hot water bags also are used; they should have covers of soft flannel so there will be no danger of burning.

Cold Applications. Cold applications may be either in the form of ice bags or cold cloths. Fill a rubber bag half full of bits of ice less than an inch square, slip the bag into a cover of soft silk or linen, and apply to the part in pain. Remove while still ice cold. *Do not use too large a bag.*

For the cold cloths lay pieces of muslin on ice, squeeze and fold in several thicknesses, lay over the seat of pain, and cover with oiled silk or rubber. If nothing else is to be had several thicknesses of soft paper may be used.

Precautions Against Infection. In all infectious diseases great care is needed to prevent the disease from being carried to other people. The one who is nursing the patient is responsible for this. In tuberculosis the discharges from the mouth and throat carry the disease; they must, therefore, be destroyed promptly. Get some of the pamphlets issued by the "National Society for Prevention of Tuberculosis" (105 East Twenty-second Street, New York City), and see how this may be done. In typhoid fever the germs are carried in the excreta from the bowels and kidneys. (See Disinfecting Plumbing Fixtures, page 36.)

When caring for persons ill of diphtheria, mumps, scarlet fever, or meningitis use an antiseptic spray for the mouth and nose, and wash the hands in a disinfectant after handling the patient.

Disinfect everything used in the sick room. All dishes must be sterilized by being boiled and should not be sent to the family kitchen.

To Disinfect Clothing. Soak all body and bed linen in a carbolic solution for one hour (five ounces of acid to one gallon of water). To disinfect a mattress, use the carbolic solution and apply with a brush.

To Disinfect a Room. Formaldehyde gas is a convenient disinfectant, but the latest investigations seem to prove that thorough cleaning removes most germs. Destroy all fabrics that cannot be steamed or boiled. If possible cleanse the walls with a vacuum cleaner; if not, brush to remove the dust. Scrub painted woodwork with soap suds. Clean polished woodwork with oiled cloths, rubbing very thoroughly. Scrub the floors and apply a disinfecting solution. Then air and if possible sun the room for several days. In most infectious diseases the germs are only on those articles that have been in contact with the

patient. In pulmonary diseases, however, they may be thrown some distance by coughing.

Disinfectant for the Nurse's Hands. For the nurse's hands use a solution of bichloride of mercury; one grain tablet to five pints of water. Use the prepared tablets; those that make a blue solution are safest, as the color is a warning of danger. Keep in a porcelain basin. *Bichloride of mercury is a deadly poison; never leave it within reach of children or with other medicines.* After washing the hands in the solution, rinse in clean water.

Some Rules for the Sick Room. Avoid unnecessary noise. Put a thick narrow pad over the latch of the door, fastening one end to each knob. Wedge blinds that rattle with folded paper; oil door hinges; keep no rocking chairs in the sick room, as the rocking may disturb the patient. While the room should be quiet, do not whisper but speak in a soft pleasant tone, never in a mournful monotone. When speaking to the patient, stand where you can be seen. Be careful not to touch the bed in moving about.

Do not tell the patient what medicine is being given, or what his pulse and temperature are. Be cheerful and try not to show anxiety. Do not speak of his condition where he can hear you. Never leave the door ajar, but shut it gently.

At night get everything ready before the patient goes to sleep so there will be no danger of waking him.

How the Nurse Should Care for Herself. Sleep whenever possible. Take meals regularly, but not in the sick room. Take a short walk every day. Get a daily bath and change the clothing. Wear comfortable clothing and soft low heeled shoes. Some persons in caring for a sick member of the family give no thought to their own health, and so become physically unable to properly attend to the patient. Very often such nurses decline to let anyone else take charge of the patient even for a short time, forgetting that the nurse can best show her love for the sick one by taking care of herself, so that she will be able to do efficient nursing when it is needed.

QUESTIONS AND PROBLEMS

Tell how to select a room for the sick. Why should the furnishings be few and simple? Describe the furnishings. Why is a single bed to be preferred? What is the proper height of the bed? How can it be adjusted if it is too low? Describe the bed linen and blankets. Where shall the bed be placed?

Give directions for ventilating the sick room. How shall it be cooled in hot weather?

What are the important points in making the bed? Tell how to change the sheets with the patient in bed. How to change the patient's gown. How to turn patient in bed. Describe the method of moving patient from one bed to another. How to change the mattress with the patient in bed. What causes bed sores? How can they be prevented?

Give directions for bathing the patient in bed. What temperature of water is most desirable for fever patients?

Tell how to select a thermometer. What is the normal temperature of the body? What does a high temperature indicate? What should be done for a person with a subnormal temperature?

What precautions must be observed in giving medicine? How should poisons be kept?

Describe the various methods of making hot and cold applications.

What precautions should be used to prevent the spread of the various infectious diseases? Write a brief list of the most feared diseases and the methods of preventing infection. How may clothing be disinfected?

How may the nurse disinfect her hands? How should she care for her health?

INVALID COOKERY

(Review the effect of heat on the different foods; also review Food and Digestion.)

In planning meals for the sick, economy except among the very poor should not be a serious consideration; whatever will hasten recovery should be provided; do not waste expensive materials, or provide them in a greater quantity than is needed.

The method of preparation is most important; a fried egg for example might cause acute indigestion, where one delicately poached, or served in eggnog, would be easily assimilated.

The appetite of a sick person should be stimulated by the appearance of the food served. A light dainty tray of the proper

size should be covered with a spotless, white cloth that just fits it; arrange the daintiest china, placing it as it would be on the table; it should not be overcrowded. Lay on the tray a bright flower with only a delicate odor, or put it in a tiny vase if there is room. As in other serving, hot food must be hot, cold food cold, but remember that cold foods are more difficult of digestion than hot, so use them sparingly, unless otherwise directed. Ices should be served alone as a meal, and eaten very slowly. Never give the patient anything that is unappetizing in appearance. Serve small portions, and remove the tray as soon as the patient has finished eating.

Never discuss menus with patients; study likes and dislikes without their knowledge, and select the food accordingly. Always serve their meals on time.

The following articles are strictly prohibited for most sick people: pork, veal, quick breads, hot breads, fried foods, pastries, highly seasoned combinations, coarse vegetables, rich desserts, most sweets and condiments, most cold food. Use only fresh clean foods for the sick. Cold storage eggs and chickens, meat, or vegetables are not safe foods for them.

INVALID DIETS

Invalid diets have been divided into liquid, soft, soft solid, and light solid, or convalescent.

Liquid Diet. A liquid diet includes beef juice, broth, egg albumin, eggnog, cream soup and gruels (strained), fruit juice, cocoa, and tea. Cooked eggs, even if very soft, are not liquids. In some cases milk is not allowed.

Soft Diet. A soft diet may include soft cooked eggs, junket, custard, toast, gelatin, and meat jellies.

Soft Solid Diet. For a soft solid diet add to the above list cream toast and very delicate vegetables such as asparagus tips and summer squash (steamed or baked).

Light Solid or Convalescent Diet. A light solid, or convalescent diet may include tender broiled meat (either beef, mutton, fish, chicken, or squab), boiled rice, baked potatoes, a

little well cooked corn bread, or a thin dry roll. *Remember that most relapses, except in some infectious diseases, are caused either by over-feeding or over-exertion.*

Special Diets. When the physician orders a special diet, the proper methods of cooking each dish should be strictly carried out. There are some general rules that apply to each class of diseases even if you have not the physician's advice.

Unless otherwise directed give fever patients a liquid diet only.

Patients ill of diarrhoea should have only bland food (food containing little irritating fat) served hot; arrow-root gruel, rice water, and tea may be used. For less severe cases well cooked rice is good. Hot foods check peristalsis, while cold ones stimulate the movement of the bowels.

Persons with an irritated condition of the stomach who are nauseated and who suffer from intestinal pains upon taking food should be given egg albumin; milk in cases like this is not digestible. If the condition is not too acute orange eggnog without sugar is sometimes pleasing.

For the constipated instead of rice and arrow-root use cornmeal gruel, beef broths and juices, and milk sugar in beverages. Tea is an astringent and should be very weak, if used at all in these cases.

Each case of illness presents a feeding problem of its own, so get the physician's advice on the subject, then apply all you know of healthful food preparation in carrying out his instructions.

Nervous Indigestion. In a case of nervous indigestion give a nourishing, easily digested diet. Let the patient rest half an hour before meals. Do not permit him to discuss food and its effect at the table. He should drink water freely half an hour before eating, but not with meals. A cup of some hot beverage may be taken at the end of the meal. Avoid all indigestible articles. Many sufferers from this ailment grow worse because of malnutrition. The following schedule followed for some weeks will be beneficial.

Upon rising in the morning take the juice of two sweet oranges. The breakfast should consist of an easily digested cereal with cream, a soft egg

and toast, weak tea or cereal coffee. At dinner, a broiled chop, chicken, fish or steak, potato or rice, a tender green vegetable—summer squash, or a purée of tender string beans or like vegetable—toast, stale bread or hot water corn bread, blueberries or ripe figs should be eaten. At supper take a soft egg or chop with toast, or a cereal with cream.

Anemia. This disease requires very nourishing and easily digested food. The schedule given for nervous indigestion may be followed for the chronic stage.

A diet somewhat rich in protein and green vegetables and fresh fruit is desirable. Some authorities believe that a carbohydrate diet with an allowance of milk is best. Marrow fat from the leg bones of beef, boiled in the bones and served on toast, is recommended.

In the acute stage hot or cold milk and egg albumin are used.

Bright's Disease. In Bright's disease give only easily digested food; an attack of acute indigestion may prove fatal. The diet must be low in protein. Restrict the quantity of meat and eggs. If there is dropsy use the least possible amount of salt. Avoid condiments and all rich dishes; give simple foods simply cooked.

Diabetes. In feeding a patient who has diabetes, use little carbohydrate. All sweets are prohibited, as are rice, macaroni, and other starchy foods, except bread, oatmeal, and potatoes in limited quantities. Proper feeding is most important in these cases. Consult a good physician and follow his directions carefully.

Tuberculosis. In the case of tubercular patients, the food must replace the great tissue waste that is going on. Milk, eggs, and meat may be used freely, but be careful not to overfeed, as any digestive disturbance interrupts progress. A carefully chosen nutritious diet that is well digested is far better than a very rich one that is not assimilated. Use fresh vegetables and fruits with the tissue building foods, as the appetite and digestion will be better for the variety. Well cooked starchy foods may be used in moderate quantities. Do not give pastries, preserves, pickled meats, fish, hash, or fried foods.

RECIPES FOR INVALIDS

The following recipes will be of use in preparing food for the sick. Others mentioned are found with recipes for children.

Oatmeal Gruel

¼ c. rolled oats
¼ tsp. salt
1½ c. boiling water
cream or milk

Put the boiling water in the upper part of a double boiler, directly over the fire. Add salt and gradually stir in the oats. Let boil for two minutes, then put it into the boiler and cook for one hour. Strain, reheat, and add cream or milk if desired.

Arrow-root Gruel

Add ½ tsp. of sugar and a tiny pinch of salt to ¾ c. of water, and heat. Rub ½ tbsp. of arrow-root in ¼ c. of cold water and add it to the hot water. Boil for twenty minutes, stirring constantly; then add it to ½ c. scalded milk; put in a double boiler and heat very hot; strain and serve while hot.

Egg Albumin

(See Diet of the Child)

Orange Eggnog

Separate one fresh egg and beat the white until stiff, and the yolk until frothy. Strain the juice from one medium-sized fresh orange through cheesecloth. Add it to the yolk, then fold in the white. Serve in a tall glass. If sugar is allowed add it to the yolk.

White of Egg With Cream

To the white of one fresh egg beaten very stiff add a tablespoonful of fresh cream. Beat until mixed, then fold in a tablespoonful of sugar and a few drops of some pleasing flavoring.

Egg With Broth

Beat one egg, white and yolk together, until well mixed. Add a pinch of salt and beat into a cup of very hot broth. Strain and serve in a hot cup.

Beef Juice

(See Diet of the Child)

Chicken Broth

Clean a chicken and cut it into small pieces as for frying. Remove the skin and fat and place in a smooth enameled or aluminum kettle. Cover with cold water, allowing one and one-half quarts for a three-pound chicken. Let it stand in a cool place for one hour. Then heat very gradually to the boiling point and add two tablespoonfuls of rice. Reduce the heat and keep hot until the meat is tender. If the broth is allowed to boil, the meat becomes hard and the juice is not extracted. If boiled after the juice is extracted the albumin is coagulated and rendered indigestible. When the flesh is tender remove it (it may be utilized in the family diet, as salad or creamed dishes) and the bones, and strain the broth through a fine sieve, rubbing the rice through. Season with salt and serve hot. It may be reheated in a double boiler at serving time.

QUESTIONS AND PROBLEMS

What can you say of the importance of feeding in disease? Why is the method of food preparation so important? How does the appearance of food affect a patient's digestion? How may the appetite be stimulated? What articles of diet are prohibited for most invalids? Why is a bland diet used for cases of diarrhoea? Would you give such patients hot or cold foods? Why is strong tea objectionable for a constipated patient? Tell how a patient suffering from nervous indigestion should be fed?

PART FOUR

LAUNDERING

CHAPTER I

Why Clotnes Are Washed. Clothes are washed to remove the dirt. Dirt is of many kinds and may contain the germs of disease. For this reason all clothing worn next to the body, and all table, bed, and kitchen linen must be boiled. Colored outer garments may be washed without boiling. Soap is used to soften the grease, but it is also an antiseptic. Sunshine is a great disinfectant and all white clothes should be dried in it. Sunshine also bleaches. Knit and crêpe underwear and crêpe gowns when worn without having been ironed are believed to be more beneficial, on account of the layer of sun dried air they bring next to the skin.

The Home Laundry. If possible a separate room should be kept for laundering; then all utensils needed may have a special place and no time or labor need be wasted in trying to find them. In many homes the laundress wastes much time looking for her utensils, carrying wood for the fire, and putting up clotheslines. In a warm climate a laundry room in the yard is better than one in the house.

The Laundry Equipment. If possible every laundry should have running water and stationary tubs; too much energy is wasted in carrying water and lifting tubs. If the conveniences named are not available, a barrel with a faucet should be filled and placed on a platform for the use of the laundress, or a garden hose may be used for taking water from a tank or hydrant at

some distance. If movable tubs are used choose light zinc ones. For bluing use a white enameled tub. The bench for the tubs should be firm and solid and of a height to suit the laundress. A good wringer saves both clothing and strength. The wash board should be of metal or glass, with only a few corrugations. One with a very rough surface causes the clothes to wear out. The wash boiler should be heated over a fire that brings it low enough for the laundress to take out the clothes without reaching too high. A large pot over a gas flame is very good.

A CONVENIENT TYPE OF IRONING BOARD.

The ironing board should be covered with a thick soft pad put on very smoothly. Keep the ironing sheet clean. Use nickle-faced irons in two weights, four and six pounds. An electric iron saves time and labor. If the surface of the irons is lightly greased with vaseline, when not in use, they will not rust. Have a good wire clothesline and wipe it carefully before hanging the clothes. Support the line with a stout pole; lower the pole when hanging the clothes, so as to avoid reaching up. Use plain wooden clothespins. Wear an apron with a pocket and never drop the pins on the ground; wash the pins if they are dirty.

Laundry Supplies. Keep all needed supplies on a convenient shelf. A mild laundry soap will be needed for ordinary washing, and some of the fine white soaps for flannels, delicate colored goods, and silks. Use a good bluing and provide the common laundry starch, and a package of prepared starch for cold starching. If the water is hard keep such chemicals as may be needed to soften it.

Hard or Soft Water. (Review page 72.) Water that contains certain forms of lime may be somewhat softened by boiling.

Water containing gypsum can be softened only by alkalies. To soften such water for coarse goods use sal soda—one tablespoonful to one gallon of water. First dissolve the soda in a little hot water, then add to the water in the boiler, and boil and skim. Some of the washing powders may be used in the same way. For finer articles soften the water with borax—one teaspoonful of borax to one gallon of water—and proceed as above.

The Care of Soiled Clothes. See that all soiled clothing is dry before putting it into the laundry basket; if left damp it may mildew. Remove stains while fresh if possible. (See Removing Stains, page 343.) Do not keep soiled clothing in bedrooms or in the kitchen. Patch or darn all clothing except stockings before washing. If clothing is sent out to be laundered make a careful list of articles.

Sorting the Clothes. Sort the clothes and arrange them in neat piles. Remove stains, if not previously done. Make the following piles: handkerchiefs, body or bed linen, dish towels, table linen, white starched goods, colored ginghams, calicoes, colored lawns or fine goods, flannels, silk hose, cotton hose, curtains (never soak curtains with other articles). Wash dish towels in a separate water, soak handkerchiefs alone before washing, soak white starched goods by themselves; all other white cottons may be soaked together. Do not soak colored goods, hosiery, or flannels. In washing follow the directions given below.

To Wash Dish Towels. Dish towels contain grease, hence soaking them in cold water does little good unless they are stiff with flour or starch. Put the towels in hot soap suds for fifteen minutes; then rub on the board, using more soap if necessary. Do not use too much force when rubbing, or holes will be worn in the fabric. If the towels are very dirty wash through a second hot soapy water; then soap well and put into a kettle where they will be well covered with hot soapsuds; boil for half an hour, punching them often with a rounded stick—an old broom handle is good. Do not let the water stop boiling or the clothes will be streaked. Take from the boiling water and drop

into a tub of tepid water stirring them about immediately to prevent streaks; wash through this water, rinse well, blue, and dry in the sun. Do not iron, but fold and keep in a dry place away from the dust. Some laundresses add one-half tablespoonful of kerosene oil to each gallon of soapsuds in which the towels are boiled.

The Bluing Water. White clothes are blued to give the appearance of whiteness. They become yellow from careless washing. Dark soaps or impure water and the bluing cover up stains. Clothes must be well rinsed before being blued, as the soap left in them will unite with certain chemicals in the bluing and cause the clothes to become stained or streaked. Ultramarine blue, a chemical substance, is sold in powders, balls, or cakes. Aniline blue, a dye, is used chiefly in laundries and is satisfactory only where the clothes are very thoroughly rinsed. It gives a pearly tint to fabrics. Prussian blue, which is a salt of iron, if heated with an alkali such as soap or washing powder, changes to another salt of iron which forms rust spots. This sometimes happens when clothes not thoroughly rinsed are blued in it.

EXPERIMENT I. Add to a test tube half full of the diluted bluing a quarter of a teaspoonful of a strong solution of sal soda. Bring to the boiling point. If it changes to a yellow or reddish brown it contains salts of iron.

Measure the water and put it into a tub or pail. Measure some bluing in a cup or spoon and pour in enough to color the water slightly; stir it well with your hand. When it looks blue enough, dip a piece of white cloth into it. Wring and see if the color is what is desired. If it is, shake out the garment and dip; then wring carefully; if not blue enough add more bluing or water as needed.

Note the brand of bluing and the amount of water and bluing used. How much bluing of this brand will be needed for a given quantity of water? Each brand of bluing varies in the amount needed. Wring blued clothes very thoroughly.

Washing the Cooking Apron. The apron, having been starched, must be soaked in cold water for an hour to remove the old starch, then washed and blued as directed for dish towels. Starch while wet, and hang on the line by the lower hem.

Starching Clothes. (Review Starch.) Clothes are starched to give a gloss to the surface and to make them slightly stiff. Do not starch underwear, handkerchiefs, or hosiery. A thin starch may be used for corset covers and slips and for the flounces of underskirts and for dresses. A thick starch is used for shirt bosoms, collars, and cuffs. Borax is added to starch to thin it so that it will enter the fibers of the cloth. Lard or paraffin is added to starch so that the garment can be ironed more smoothly. If paraffin is added to starch it must be used while warm. Otherwise it may form tiny lumps and cause greasy spots upon the garments when they are ironed.

Dip the garment in the starch, rubbing it well between the hands, so that the starch will penetrate. Wring well, then shake out and dry in the sun.

Starch. Rub two and one-half tablespoonfuls of laundry starch to a paste with one-fourth cup of cold water. Add slowly two cups of boiling water, stirring all the time. Continue stirring and boil for five minutes. Turn into a basin or deep pan. Add one cup of cold water and stir well. Add bluing if desired.

If borax is used, add one-half teaspoonful of borax to the quantity of starch given above; dissolve it with a little hot water and boil with the starch; if paraffin or lard is used, add one-fourth teaspoonful of lard or one-fourth teaspoonful of shredded paraffin (that from a candle is satisfactory) to the starch just as it boils.

To Dampen Clothes for Ironing. Clothes are dampened or sprinkled so that they may be ironed very smooth. Shake the clothes as they are taken from the line and put them in a dry place where no dirt can reach them. Cover the ironing table with a sheet; lay the garment to be sprinkled on the table. Have a bowl of lukewarm water ready and be sure that the hands are clean. Dip the right hand into the water, taking up a little

of it and shaking it over the clothes so that a fine spray is made. Do this until the whole surface is damp, but not wet; then fold the piece of clothing right side in and roll it up tightly. Wrap in a towel and let stand for several hours or over night. When sprinkling a number of pieces, line a basket with a folded sheet and pack the pieces in it firmly; then cover closely. Do not sprinkle colored goods until they are ready to be ironed. Do not let sprinkled clothes stand longer than twelve hours in summer, as they may mildew.

Ironing. Have the irons hot; test by rubbing on a pad to see if they are clean and smooth; if they are not, rub well on sand or salt, then on a paraffin cloth, and finally on a clean cloth. Never put an iron to heat where it will become smoked. Use a heavy iron for table linen and a lighter and more pointed one for garments with gathers. Have the iron very hot for white goods, but cooler for colored, as the color will be injured by a hot iron. Iron calicoes on the wrong side and white goods on the right. Iron with the thread of the goods. If a crease is accidentally made wipe with a damp cloth and iron again.

Ironing the Cooking Apron. Iron the dampened apron with a hot iron on the right side, the bib first; then the skirt a width at a time, beginning with the hem. Use long quick strokes. Work quickly in the gathers. Press the facings, tabs, and bands on the wrong side as well as the right. The apron must be smooth and perfectly dry when finished. Hang it on the rack for a while to air and dry perfectly; then fold to suit the space in which it is to be kept. Fold all buttons and tapes in, making the piece as neat as possible.

Table Linen. Remove the stains and soak in weak soapsuds, then wring from the suds and wash as directed above. Use a very thin starch, if any. Fasten on the line by hanging one hem about four inches over the line and pinning it in several places. Begin at the selvage; then carry the hem at the other end over the first, pinning it in the same manner so as to make a sort of bag. Take from the line as soon as dry, as the cloth, being heavy, will stretch if blown about by the wind. Iron table linen while

still damp, or sprinkle very thoroughly and let stand for several hours, then iron with a hot iron. Pull the cloth straight and fold down the center, right side out, selvages together, ends even, threads straight. Lay lengthwise on the board, with fold to the left; iron one side until partly dry; then turn the cloth over, still folded, and iron the other half; repeat until it is smooth and dry; roll on a pasteboard tube, or fold and put away. Do not press across folds. Fold napkins lengthwise and put selvages together. Pull smooth, open, and iron, first on right side, then on the other. Fold in center and press crease in. Tray cloths and centerpieces should have the hem and corners true. Roll or leave flat; do not fold.

The Body Linens. Wash the linen as directed for dish towels. Do not starch garments worn next to the body. Do not iron crêpe or knitted underwear. Hang crêpe gowns and dresses on coat hangers to keep the shape. Iron trimming on underwear first, then bands and sleeves. Iron combination suits and night gowns in the same manner, doing the upper part first.

Handkerchiefs should be very damp when ironed. Fold in half and pull the hems even; then unfold and iron on both sides. Fold into shape but do not crease with the iron.

Hosiery. Wash silk and cotton hose apart from other clothing, as the lint will stick to them. The same water may be used for both if the silk is washed first. Use a moderately warm water and a mild white soap. Use lukewarm water for white and light colored silk hose. Never boil or soak hose. Dry quickly in the shade, pinning them on the line in shape. Never hang them so that they will be whipped about in the wind. Iron on the wrong side with a barely warm iron, then fold.

The Shirt Waist. Wash, starch, and sprinkle a white shirt waist as directed for the cooking apron. When ready to iron, smooth well into shape. Then iron the neck band, cuffs, waist band, and pleats (first on the right side a little, then on the wrong); then iron the front, then the back, then the sleeves, beginning on the seam side.

To Iron a Skirt. Sprinkle as directed; slip the skirt over the ironing board, having the floor beneath covered with a clean paper. Iron the hem of one width or gore until dry. Then iron the upper part, being careful of the gathers or tucks at the waist. Iron the next width in the same way; then the seam between. When finished take the skirt off the board and press the waist band on the wrong side if needed. Iron petticoats in the same way, doing the flounce first.

Washing Flannels. Shake the flannels and brush well. Make a suds of soft lukewarm water and a good white soap. Wash the flannel by squeezing and kneading between the hands (do not use a board). Then squeeze well and wash through another suds of the same temperature. Rinse through two soft lukewarm waters. Wring in a wringer or squeeze as dry as possible with the hands and dry quickly in the sunshine or in a moderately warm room. If hung out in a freezing temperature they will be stiff, or if heated too much while drying they will shrink. Success in washing flannels depends upon having all the water of the same lukewarm temperature, keeping the fibers free from twist, and drying quickly. Wash the cleanest flannels first and the colored ones after the white ones.

Cleaning Silk. Washable silks may be washed in lukewarm soapsuds, made of soft water and a mild white soap. Proceed as for flannels and iron on the wrong side with an iron that is warm, not hot, while still slightly damp. Pongee should be thoroughly dry. A hot iron makes silk shrink. Do not sprinkle silk as it may show spots.

Using Gasoline and Alcohol. *Never use gasoline indoors, or where there is a fire. Keep gasoline away from the house.* Brush the garments well and see where the most soiled portions are. Then cover with gasoline in a small tub. Turn another tub over it and let stand for twenty minutes. Then punch and knead to loosen the dirt. Squeeze out the gasoline and change to a fresh vessel of gasoline. Rinse and see if the gasoline comes out clear; if not use more gasoline. When clean hang on a coat hanger (if a large garment) to dry. Air for two days before

pressing. If a garment is very soiled wash in gasoline with naphtha soap, just as with soap and water; naphtha soap is not desirable for delicate colors, however, as it dulls them. It is best to use a large quantity of gasoline; then pour it into jugs, let it settle, and keep the clear part for later use.

Denatured alcohol is used like gasoline; it, too, is inflammable and should not be used near the fire.

REMOVING STAINS FROM WASHABLE GOODS

Fruit, Coffee, Tea, and Chocolate Stains. These may all be removed from table linen by the use of hot water. Stretch the stained part over a bowl and pour boiling water over it. Rub between the hands and repeat the process if the stain does not disappear.

Grass Stains. These stains may be removed by moistening the soiled spot with chloroform; then washing in soapsuds; or by moistening and washing with alcohol.

Blood Stains. Blood stains should be washed out immediately in cold water. If they are old soak them in tepid soapsuds, then wash.

Perspiration. Wash out perspiration while still damp. If very yellow soak in soapsuds. Wash and lay on the grass in the sun and dew for several days. In colored garments perspiration usually takes out the color.

Fly Paper. Soak fly paper stains in kerosene oil, then wash in soapsuds.

Vaseline. Soak vaseline spots in kerosene oil before washing.

Tar or Machine Oil. Rub tar or machine oil well with lard and let stand over night; then wash.

Iron Rust. Moisten iron rust with lemon juice and salt and put garment in the sunshine; repeat after a short time and rub well. If stains are bad use two parts water and one part hydrochloric acid; wash out thoroughly.

Scorched Stains. Wipe scorched stains with a damp cloth and put in the sun; repeat if necessary.

Ink. Soak ink stains in sour milk, then wash.

Paint. Wash paint in warm soapsuds; if very hard soften with turpentine.

BLEACHING: SETTING AND BRIGHTENING COLORS.

Bleaching. Clothing that has become yellow may be bleached by the following harmless bleach: Dissolve 1 tbsp. of cream of tartar in three qts. of boiling water. After washing and rinsing carefully soak the articles to be bleached for twelve hours in the solution, then rinse, blue, and dry in the sun.

Javelle water is a stronger bleach. To make it, dissolve 4 oz. of chloride of lime in 1 qt. of cold water and 1 lb. of sal soda in 1 qt. of boiling water, then mix the two. Let stand for four hours, then drain the clear water into another bottle. Use 1 tbsp. of the solution to 1 gal. of water and heat the article to be bleached in it for thirty minutes, keeping the temperature below 100° F. Rinse very thoroughly and dry.

To Set Colors. To set very delicate colors, lavender, for instance, use one ounce of sugar of lead in one gallon of cold water and soak for three hours. Then rinse and dry in the shade.

Use a salt solution for blacks, pinks, and reds, soaking separately; one-half cup of salt to one gallon of cold water. Proceed as above, soaking for half an hour.

To Brighten Colors. Dip a faded blue in bluing water each time after washing, or rinse in a weak alum water, and dry in the shade.

For pink, use red ink, making the water of the desired color, as directed for bluing. Mix thoroughly and wring the garment out immediately. Do not use too much ink as the garment will then be streaked.

For browns or tans, use water, colored with tea or coffee.

Putting Away the Clothes. As soon as the clothing is thoroughly dry it should be carefully put away as a protection from dust and to prevent starched clothing from losing its stiffness. Keep all clothing near where it is to be used. In putting it away lay the freshly laundered underneath the piles already on hand, so that all garments may be used in a regular order.

Winter Clothing. Furs and woolen garments should be cleansed thoroughly, brushed with a stiff brush, particularly along the inside of seams and under folds and collars, then exposed to the hot sun to destroy the eggs of moths, and finally packed in cloth or paper tightly sewed or sealed and put away in moth proof chests.

Moth balls and oil of cedar do not destroy the eggs or larvae of moths, and if the clothing is not carefully cleaned the eggs may hatch and eat the garment even when it is packed in moth balls. The adult moth is kept away by strong odors, but if the garment is cleansed and packed as it should be no moths can enter. Such strong odors are hard to remove and are most unpleasant. A cedar chest or closet is supposed to be a moth protection for clothes that have been thoroughly cleaned.

QUESTIONS AND PROBLEMS

Why are clothes washed? Where are yours washed? Are the conditions sanitary? Is the washing done by people affected with tuberculosis, skin, or other contagious diseases? If done in the home of the laundress what conveniences has she for caring for the clothes? Does she put them in her bedroom?

Has your laundress any labor saving machinery or equipment? Could she use a power washing machine? Has she stationary tubs, running water, benches of the proper height, or electric or gas irons? What could be done to save her strength? Investigate the conditions of your laundress' home if your washing is done in it. Investigate also the conditions of the public laundries, considering carefully the sanitary conditions and the welfare of the workers. Compare the hygienic conditions and cost of laundering done in the public laundry, and at home, and laundering carried home by the laundress. Consider the cost of fuel, soap, and other supplies, also the "wear and tear" upon clothing washed under these varying conditions.

How could you lessen your laundry bill without sacrificing cleanliness? What clothes could be left unironed? How does elaborate decoration or the quality of the fabric affect the cost of laundering? How could labor be saved on table linen?

What clothing should be boiled? Can colored clothes be boiled without being faded? What is the value of sunlight? Can colored clothing be dried in the sunlight? Why is sun dried clothing considered beneficial to health? Why is soap used? Why are clothes hung on a rack after being ironed?

What do you think of the conveniences in the average home laundry? Why are benches, boards, and lines of the proper height so important? Make a list of a complete and moderately expensive laundry equipment.

Compare cost of charcoal, coal, wood, gas, gasoline, and electricity for ironing; consider carefully time and labor involved as well as cost. What fuels are used for heating irons in your locality?

Is your water soft or hard? Could you get soft water? What is the advantage in its use?

Do you use washing powders? Why? Which is cheaper, to have clothing replaced because weakened by excess of powder, or to use time and strength in laundering and repairing old clothes?

Make a list of the laundry supplies you need. What brands of soap, starch, and bluing are to be recommended? Why are clothes punched while boiling? Why are clothes blued? Why is thorough rinsing needed first?

Why should soiled clothing be dried before being put away?

Make a brief outline of important points in washing the family clothing, listing each class of clothing separately. Tell how to remove stains that may be found on the soiled articles. Make a laundry list for your family. Write directions for putting the weekly laundry away; for care of winter clothing.

APPENDIX

SUPPLEMENTARY RECIPES

BREADS

Yorkshire Pudding

Use the popover recipe (p. 200). Beat the eggs thoroughly with the dover egg beater and add them to the batter. Grease a hot baking pan with fat from a roast and put in the mixture, having it one-half an inch deep. Bake for twenty minutes in a hot oven. When well risen brush the top with some of the fat from the roast. Serve hot, cut in squares as an accompaniment to roast beef. The pudding may be baked in muffin pans.

Hot Water Corn Bread (Class Recipe ¼)

1 qt. sifted cornmeal — 1 tbsp. salt

Use enough rapidly boiling water to make a dough that will not spread when shaped with a spoon.

Use fresh, sweet meal. Sift the meal and the salt, then pour on the boiling water very quickly. Stir briskly to prevent lumping. The amount of water depends on the kind of meal. The dough should be like very thick mush. When it is perfectly smooth, dip a tablespoon in cold water and take up a spoonful of dough and turn into a baking pan that has been lightly sprinkled with meal. The cakes may be shaped in small pones with the hands. Put immediately into a very hot oven and cook for ten minutes where the bottom will be very hot; then put where the top will brown quickly. The secret in baking this bread lies in having a very hot oven and browning the top and bottom quickly. Cook for thirty or forty minutes. What is the leavening agent in this bread?

Waffles

1¾ c. flour	3 tsp. baking powder
½ tsp. salt	1 c. milk
2 eggs	1 tbsp. melted butter

Sour milk and one-half teaspoonful of soda may be substituted for sweet milk and baking powder.

Mix and sift the dry ingredients. Beat the egg yolks well. Add them to the milk. Then add the egg mixture to the flour. Add the butter. Then fold in the stiffly beaten whites. Put one tablespoonful of batter into each square of the hot well greased waffle iron, near the center. Close the iron and turn almost immediately. Serve hot.

The waffle iron must fit the range, and be very clean. Heat it on one side; then turn and heat the other. When very hot grease well with a pastry brush dipped in melted fat, or use a bit of cheesecloth on a fork

Sour Milk Corn Bread (Class Recipe ⅓)

(See Experiment IV, page 196)

3 c. cornmeal	1¼ tsp. soda
1 tsp. salt	3 c. thick sour milk
1 egg	1 tbsp. lard or butter

Proceed as for light muffins. Beat the milk well before adding it to the meal. Cook in a greased baking pan, having the batter three-fourths of an inch deep. Bake for twenty-five minutes.

Dumplings for Meat Stew (Class Recipe ¼)

2 c. flour	2 tsp. baking powder
½ tsp. salt	milk or water enough to make a drop batter

Mix and sift the dry ingredients. Add the liquid. Mix and drop immediately by the teaspoonful into the boiling stew. Cover the kettle and boil for twelve minutes.

Emergency Biscuit

Make the dough a little softer than for baking powder biscuit (See page 205) by adding more liquid. Drop the dough by the spoonful on to a lightly greased pan. Bake as directed.

Soda Biscuit (Class Recipe ¼)

(See Experiment IV, page 196)

1 qt. flour	1 tsp. soda
1 tsp. salt	1 tsp. baking powder
1¾ c. sour milk	4 tbsp. shortening

Proceed as for baking powder biscuit. Compare with baking powder biscuit.

Dainty Biscuit

2 c. pastry flour
4 tsp. baking powder
½ tsp. salt
¾ c. rich thick cream

Sift the dry ingredients together several times; then mix as directed for baking powder biscuit. (See page 205.) Roll into a sheet one-fourth of an inch thick. Cut in rounds an inch in diameter. Bake in a quick oven until a golden brown. Serve unbuttered with a salad course.

Whole Wheat Biscuit

2 c. whole wheat flour
3 tsp. baking powder
2 tbsp. lard or butter
½ c. white flour
½ tsp. salt
¾ to 1 c. milk or water

Proceed as for baking powder biscuit. (See page 205.)

Beaten Biscuit

2 c. flour
2 tbsp. shortening
1 tsp. salt
¼ to ½ c. liquid

These biscuit are made light by steam and by the expansion of the air beaten in.

Proceed as for biscuit. Turn the mixture on a board and beat with a rolling-pin. When one-eighth of an inch thick fold the dough once and quickly pat the edges together to retain the air. Continue beating and folding for one-half hour. Beat to three-fourths inch thickness, cut with a small biscuit cutter, prick with a fork, and bake in a quick oven for twenty minutes. What is the leavening agent in these biscuits?

Bread Sticks

Proceed as for Parker House rolls, using the sponge method. When ready to mold roll a small piece of dough under the hand until it is shaped like a lead pencil. Lay it in a greased bread stick pan, or on a greased baking sheet. Brush with melted butter. If put in the pan let it double in bulk but not rise above the edges of the pan. Bake in a quick oven for ten or fifteen minutes.

Hot Cross Buns

flour
1 tsp. salt
½ c. raisins
¼ c. butter
1 pt. scalded milk
½ c. sugar
1½ tsp. cinnamon
1 cake compressed yeast
½ c. lukewarm water
2 eggs

In making these buns the same care is needed as in making other yeast mixtures containing much sugar. The rising process must be quickly completed or the bread will sour.

Proceed as for rolls, adding the well-beaten eggs after the yeast is beaten for five minutes. Add the raisins and flour enough to make a soft dough that can be rolled. When light, knead and roll to an inch in thickness. Cut with a large biscuit cutter and place one inch apart on a baking sheet. When light brush with the yolk of an egg beaten with a half teaspoonful of water. Bake in a moderately hot oven for twenty-five or thirty minutes. When cold form a cross on top with ornamental frosting, using a pastry bag and tube.

Swedish Tea Bread

flour
⅛ tsp. salt
½ tsp. almond extract
1¼ c. scalded milk
⅓ c. sugar
½ cake compressed yeast
1 egg
4 tbsp. melted butter

Make a sponge of the yeast cake, one-fourth cup of milk, and one-half cup of flour. When light add remaining milk and two and one-fourth cups of flour. Let rise again and add the remaining ingredients and about three-fourths cup of flour. Knead well and let rise. When light knead again and divide into three parts and roll under the hand into strips. Braid the strips together and lay in a circle on a greased baking sheet. Let rise and then brush the top with the yolk of an egg to which has been added one-half teaspoonful of cold water. Sprinkle with chopped almonds and bake in a moderately hot oven.

Coffee Cake

3 c. flour (about)
1 tsp. salt
1 c. scalded milk
¼ c. lukewarm water
¼ c. sugar
⅔ cake compressed yeast (or ½ cake dry yeast)
¼ c. shortening
1 egg

Mix as for Parker House rolls (see p. 217), making the dough almost stiff enough to knead. Add the egg with the yeast, turn on a board, and cut through and through. Return to the bowl and let rise well—then cut again and turn into a well greased tin about 5x10 inches. Put in a warm place and when nearly double in bulk cover with the paste given below and bake in a moderately hot oven for half an hour.

Paste for Coffee Cake

¼ c. sugar
1 doz. blanched almonds
1 tsp. cinnamon
¼ c. butter

Rub the sugar, cinnamon, and butter together. Set in a warm place and stir until melted. Add the finely chopped almonds and spread over the cake, being careful to touch it lightly, so that it will not fall. If too much paste is put in one place it will break through the cake.

Milk Toast

Butter slices of crisp toast and pour over them scalded milk to which a pinch of salt has been added. Serve immediately. A thin white sauce may be substituted for the milk.

BUTTER (CHURNING)

(If you live in a district where butter making is practiced, study the ripening of cream, working of butter, etc. See Farmers' Bulletin No. 241, U. S. Department of Agriculture.)

Cream for churning must be brought to the proper temperature, about 58° F. (varying with the time of year, the food of the cows, and other conditions); test with a dairy thermometer. If the cream has to be cooled several degrees it should be kept at the churning temperature for three or four hours, as fats cool very slowly. If ice is not available for cooling the cream use the coldest water to be had and churn in the coolest part of the day. In winter the cream must be warmed, by keeping it in a warm place or by placing the jar containing it in warm, but not hot, water.

Have the churn scalded and well cooled. The time required for churning depends largely on the temperature and the kind of churn; the average time is from thirty to thirty-five minutes. If churning is done too rapidly, the butter will be oily and fluffy, while if the rate of churning is too slow a great deal of time is consumed. When the butter is ready wash and salt in a wooden bowl, if a dash churn is used. In a barrel churn, drain off the buttermilk and wash the butter in the churn, using plenty of clean cold water. Then drain off the water and add salt (the usual proportion is one ounce of salt to a pound of butter). Give the churn a few turns, remove butter to tray, and work with a wooden paddle to mix in the salt. When fairly well mixed, let stand twenty minutes or half an hour, and then finish the working. Taste the butter while working and add more salt if needed, or if too much has been used wash a little out. Much depends on the way in which butter is worked. A bowl and paddle are not as satisfactory as a table

and roller, but these are not available for most housekeepers. If butter has a mottled appearance the salt has not been thoroughly mixed with it. It may be improved by reworking. If butter shows curdy specks the fault lies in the cream; it may be improved by careful washing while the butter is still granular.

Care of the Churn. As soon as the churning is finished, rinse the churn thoroughly with clean cold water. Fill partly with boiling water and put on the lid, fastening it loosely so that the steam may escape. Turn the churn a few times. Empty, and repeat the scalding process. Invert for a few moments to drain, then turn the opening up and let dry. Clean a dash churn, also wooden paddles and bowls in the same way. Scald occasionally with lime water. Churns and other wooden utensils are scalded immediately before using to prevent substances from sticking.

Buttermilk. If heavy cream is churned there will be very little buttermilk; but if an equal quantity of good clabber is poured into the churn and the whole churned for about ten minutes, very good buttermilk may be made. For a richer buttermilk add ¼ c. cream for each quart.

CAKES

Yellow Cake

Use the cup cake recipe (p. 245), substituting eight yolks for the whole egg and adding one-half cup flour as the yolks are rich in fat.

Cream the butter with one and one-half cups of sugar. Beat the yolks with a dover egg beater until thick and lemon colored. Add the half cup of sugar, and beat well. (When egg yolks are added directly to the butter and sugar the cake may be of an uneven color.) Mix egg and butter mixtures. Add the other ingredients as in cup cake. Bake in a loaf or in a sheet; a sheet will require less time for baking. Do not have the oven hot or the texture will be spoiled. Frost with ornamental frosting (p. 240), or if in a sheet it may be cut with a heart-shaped cutter and dipped in melted fondant.

For a yellow and white course this cake cut in squares after being frosted gives a pleasing contrast of white frosting and yellow cake.

White Loaf Cake

Use the cup cake recipe, substituting eight whites for the whole eggs, and flavor with one-third teaspoonful of vanilla and two-thirds teaspoonful of almond extract. Add one-half cup of chopped and floured raisins if desired before folding in the whites. A white cake requires a slightly cooler oven than other butter cakes. Bake in a loaf or in two layers. Frost with chocolate frosting.

A Tender Loaf Cake

2¼ c. flour
2 c. sugar
1 tsp. cinnamon
¼ or ½ c. cocoa or grated chocolate
1 c. butter
½ c. sweet milk
2 tsp. baking powder
1 c. chopped pecans
¼ tsp. mace
1 c. fresh boiled and mashed potato
4 eggs

Proceed as for cup cake. Add the warm mashed potato (do not use cold potato or the cake will not be smooth). To the butter and sugar add pecans before the whites of eggs are folded in. Bake for one hour as directed for loaf cakes with butter. Compare proportions of principal ingredients, including potato, with that of cup cake. Frost if desired.

Fruit Cake

Fruit cake is an old-time delicacy handed down from England. It is very rich and is difficult to digest when eaten, as it usually is, in the holiday season when we have feasted more than is good for us. It should be made at least a month before it is to be used.

½ lb. flour
⅝ lb. butter
2½ lbs. raisins
½ lb. pecans
½ tbsp. mace
¼ tsp. cloves
6 eggs
⅝ lb. sugar
¾ lb. currants
½ lb. citron
¼ lb. almonds
1 tbsp. cinnamon
1 grated nutmeg
¾ c. grape juice

Wash and dry the currants on a cloth and then in a very moderate oven. Seed and chop the raisins. Slice the citron thin and cut in small pieces. Chop the nuts after blanching the almonds (see Fats). Flour the fruit well with a few tablespoonfuls of the flour. Cream the butter and sugar, add the well beaten yolks of the eggs, the flour sifted with the spices, the fruit juice, and the whites of eggs beaten stiff. Then work in the fruit and nuts. Bake in a deep pan. Line the pan with heavy writing paper greased with lard. Dredge it with flour, invert, and rap sharply. Put the cake in and smooth well, leaving a depression in the center. Bake in a very slow oven for three hours. Test by pressing with the finger; if it is firm to the touch it is done. In most cities one can send the cake to the bakery and have it baked for a small sum; this is a saving of time and fuel. Why does fruit cake burn easily?

A Cheap Fruit Cake

Part 1.

⅔ c. lard
⅓ tsp. cloves
2 c. brown sugar
1 tsp. ginger
2 c. raisins
1 tsp. cinnamon
2 c. water
1 tsp. salt
½ nutmeg grated

Part 2.

2 tsp. soda
2 c. chopped nuts
¼ c. warm water
4 c. flour
2 tsp. baking powder

Put the ingredients of Part 1 in a smooth saucepan, bring to the boiling point, and cook gently for twenty minutes. Cool. Add the soda which has been dissolved in the hot water, then the flour, which has the baking powder sifted in it. Add the chopped nuts. The mixture should be very stiff when finished. Bake in a tube pan, in a moderate oven for an hour and a half, or in a fireless cooker for the same length of time, heating the radiators as for biscuit.

Angel Cake

(Review Egg Cutting and Folding, page 131)

1 c. flour
⅛ tsp. salt
1¼ c. egg whites
1¼ c. sugar
1 tsp. cream tartar

Prepare the flour and sugar as for sponge cake. Beat the eggs in a large bowl until slightly frothy; then sift in cream of tartar and salt. (The cream of tartar toughens the albumin of the egg so that the walls of the air cells are firmer and the cake rises better.) Beat until the bowl can be inverted without turning out the egg, then fold in the sugar very carefully. Fold in the flour as directed for sponge cake, turn into a tube pan (ungreased if a special pan is kept for angel cake), and bake as directed above. Angel cake requires a little less time and a slightly lower temperature than sponge cake. Angel and sponge cakes are better if served the day they are made.

Angel Cakelets

Bake angel cake in individual tins for thirty minutes. Frost with ornamental frosting and serve fresh.

Meringues

¼ tsp. salt
3 egg whites
¾ c. powdered sugar rolled and sifted

Add the salt to eggs. Beat until foamy; then add the sugar a little at a time, beating constantly. When all the sugar is in and the egg is very stiff form into rounds on a paper laid on a board that will fit the oven, using a spoon or a pastry bag and tube. Smooth the top with a knife. For large meringues use one and one-half tablespoonfuls of the mixture. Put the meringues in a cool oven or on the back of the range to dry for an hour. When dry scrape out center. Fill large meringues with ice cream or whipped cream; brush edges of small ones with beaten egg-whites. Fill with whipped cream and stick the two together.

Pecan Macaroons

1 c. pecan meats
¼ tsp. salt
1 egg-white
½ c. granulated sugar
½ c. brown sugar

Dry and chop the pecans and sprinkle with the salt. Beat the egg stiff and beat the sugar in gradually, then fold in the pecans. Drop the cakes from the tip of a spoon one inch apart on to a buttered baking sheet. Bake in a very moderate oven until a delicate brown is secured. If the oven is too hot the cakes will spread too much.

CANDIES

Pulling Candy

1 c. corn syrup
2 tbsp. butter
1 tsp. vanilla extract
1 c. sugar
1 tsp. vinegar

Put the syrup and sugar in a deep aluminum saucepan and cook over a moderate heat (stirring it just enough to dissolve the sugar) until a little dropped in ice water hardens quickly. Add the other ingredients and boil for two minutes. Pour into buttered plates, and when cool enough to handle, rub the fingers with butter and pull it back and forth until it is stiff. Pull into a strip about as thick as the finger and cut into inch lengths. Dip the pieces in powdered sugar and wrap in oblongs of oiled paper (two by three inches). Why is vinegar added?

Fruits Glacé (Class Recipe ½)

2 c. sugar	½ c. water
¼ tsp. cream tartar	oranges, strawberries, cherries

Cook the syrup, adding cream of tartar as directed for fondant, until it reaches the crack stage, which is just before the caramel stage. Test by dropping a little candy into ice water; if it becomes brittle immediately set the saucepan in a pan of cold water. If glacé is stirred it will granulate. Dip fruit in, one piece at a time, lifting sections of orange with two forks; lay fruit on oiled paper.

Preparing the Fruit. Peel orange, separate sections, and dry. Wash sugar from candied cherries, dry, then dip and attach artificial stems. Fruits glacé can be kept only one day. Dry weather is necessary for making.

Nuts Glacé

Use blanched almonds, pecan, or walnut meats, or roasted peanuts with the brown skin rubbed off. Drop into the glacé and remove with a hat pin.

Divinity

3 c. sugar	1 c. nuts
¾ c. corn syrup	1 c. water
1 tsp. vanilla	2 egg-whites

Boil sugar, water, and syrup together until it spins a thread when dropped from the tip of the spoon. Pour one third of the mixture over the well beaten whites of the eggs and beat well. Cook the remainder to the crack stage (as in fruits glacé). Add it slowly to the egg mixture and beat until it begins to cream. Add flavoring and nuts. Turn into a buttered platter and cut in squares, or drop from the tip of a spoon on to a buttered paper.

CREAM

Frothy Whipped Cream

Proceed as directed for whipped cream (p. 82), but use a whisk egg beater and dip the froth into a bowl as it forms.

CHEESE

Cottage Cheese

Proceed as in Experiment IV, page 139, or heat sour milk over hot water to 96° F. Cool thoroughly and proceed as in Experiment IV.

If a richer cheese is desired, add cream in the proportion of one cup of cream to the curd from one gallon of clabber after curd is pressed. Pack in a bowl and keep in a cool place for one hour. Serve in sandwiches, or with salt and pepper, or with cream and sugar as a dessert. It may be seasoned with caraway seed, shredded parsley or olives.

Cheese Soufflé (Class Recipe)

¼ c. milk
1 tbsp. finely chopped or grated cheese
spk. of cayenne (or paprika)
tiny pinch of salt
2 tbsp. flour
½ tbsp. butter
½ an egg

A soufflé is a puffed dish—that is, one made light by the expansion of the air folded in, as in light omelet.

Rub the milk and flour to a paste and turn into a double boiler. Stir until it thickens and cook for five minutes. Add the cheese, salt, and cayenne, and cook until the cheese is melted. Remove from the fire. Add the butter and the well-beaten yolk of the egg. Cool, and fold in the stiffly beaten white. Turn into ramekins or custard cups that have been lightly greased with butter. Set the cups in a pan of hot water and cook in a moderately hot oven for about twenty minutes, or until well puffed and of a delicate golden color. If overcooked the soufflé will fall. Serve immediately. The soufflé may be cooked in a pudding dish.

Welsh Rarebit

½ c. milk
1 tbsp. butter
1 egg
1 c. chopped or grated cheese
¼ tsp. salt
a tiny dash of paprika or cayenne for each service

Scald the milk in a double boiler. Add butter, cheese, and seasonings, and stir until the cheese is melted. (Do not let the water in the lower kettle boil.) Add the well-beaten egg. Stir until it thickens, pour over toasted crackers, and serve immediately.

Cheese Bread (A Meat Substitute)

1 c. bread crumbs
1 c. chopped cheese
¼ tsp. salt
1 c. milk
2 eggs

Put the cheese, milk, and bread into a baking dish in a warm place until the cheese melts without becoming very hot. Then stir well, add salt, and beat in two eggs. Bake in a moderate oven for about twenty minutes until firm and well puffed. This is a very good way of utilizing stale bread.

CHICKEN

Pan Broiled Chicken

Only tender, plump chickens are fit for broiling. Clean the chicken and split it down the length of the backbone. Make an incision at each side of the breastbone, slip the knife alongside of the breastbone and remove it, being careful not to gash the flesh or cut through the skin in taking out the bone. Heat a steel griddle very hot, grease lightly with bacon fat, and lay the chicken on it, flesh side down. Turn frequently, leaving the skin side down only a few seconds, as it burns easily. In about five minutes after the chicken is thoroughly heated reduce the heat and cover the pan with a closely fitting plate. Continue turning frequently, being careful not to have too great a heat. Chicken burns easily and since it must be cooked for at least twenty-five minutes, the fire must be very moderate. About ten minutes before it is done begin basting it lightly with melted butter. Repeat whenever it is turned. When the chicken is tender and a delicate brown, remove to a hot platter, season with salt, pepper, and two tablespoonfuls of melted butter to which one teaspoonful of lemon juice and one teaspoonful of finely shredded parsley have been added. Garnish with parsley and slices of lemon.

Broiled Chicken

Prepare as for pan broiled chicken, and proceed as for broiled steak (p. 165), cooking for twenty-five minutes. Turn the chicken frequently and keep the flesh side down the greater part of the time.

Chicken Pie

tender 3-lb. chicken	3 slices salt pork
flour	salt
pepper	2 qts. boiling water
2 tbsp. butter	1 c. cream or very rich milk (hot)

Prepare as for stewed chicken (p. 183). When tender add pepper, butter, and additional salt if necessary. Set on back of range until crust is ready.

Crust for Chicken Pie. Make a soft biscuit crust, using four times the biscuit recipe and making it richer by doubling the shortening.

Take one-half of the crust and roll into a sheet one-eighth inch thick. Select a round pan about four inches deep, line the sides with the paste, place the pan on the stove, and turn in the chicken, first removing the salt pork. Cut the bits of crust remaining on the board into small pieces and drop into the pie. Roll the remainder of the crust into a sheet one-eighth inch thick; lay it over the pan, which should be kept on the stove. Trim the crust into shape, prick with a fork, making an opening an inch

in diameter in the center of the crust. Put the pie in a hot oven and bake for twenty minutes. Then pour in the hot cream. Return it to the oven for a few minutes and serve in the pan in which it was cooked.

Maryland Chicken

Cut the chicken as for panning, proceed as for breaded mutton chops, and cook in a hot oven for twenty minutes or until tender. Baste after the first five minutes with melted butter or bacon fat. Use one-fourth cup of butter. When cooked pour over it a white sauce and serve.

Chicken with Rice

Proceed as for stewed chicken (unless a very fat chicken is used, add three slices of salt pork). Put in a large saucepan and cook gently until fairly tender. Then measure the liquid and add enough hot water to make a quart. Pour it back over the chicken and bring to the boiling point. Add one tablespoonful of butter, or, if pork is not used, add three tablespoonfuls of butter and one cup of well washed rice, and salt to taste. Cook for forty minutes and serve.

COFFEE

After Dinner Coffee

For strong black coffee to be served after dinner, use any of the given recipes, taking only half the amount of water.

Coffee in Quantity

1 lb. finely ground coffee 7½ qts. boiling water

Put the coffee into a cheesecloth bag (9x18 in.) and drop the bag into a kettle containing the boiling water. Cover and keep hot on the back of range or on radiator of fireless cooker for ten or fifteen minutes according to strength desired. Remove the bag and, if the coffee is too strong, dilute with hot water. One pound of coffee serves forty persons.

CROQUETTES

Rice Croquettes with Jelly (Baked)

Season the rice with butter and salt while hot, adding enough lightly beaten egg to moisten. Form into small cakes, making a depression in the center of the top. Cook in a quick oven for fifteen minutes, put a spoonful of jelly in the center of each, and serve with roast or boiled chicken or turkey; or dip in egg and crumbs (see p. 122) before baking.

Potato Croquettes

2 c. mashed potatoes
½ tsp. salt
¼ tsp. celery salt
1 or 2 egg yolks
2 tbsp. butter

Beat the eggs slightly and add to the potatoes and seasonings. Add a little milk if the potatoes are very dry. Cook in a smooth saucepan, stirring constantly until the whole leaves the sides of the pan. When cool, shape them, dip in egg and crumbs (see p. 122), and brown in a hot oven.

DESSERTS

Angel Cake with Strawberries

Bake angel cake in ring molds, fill the center with sweetened strawberries, and cover with whipped cream.

Charlotte Russe

Line china ramekins with strips of sponge cake. Fill the center with whipped cream sweetened and flavored. Use one-fourth cup of light whipped cream, whip and fold in one and one-fourth tablespoonfuls of sugar and fifteen drops of vanilla. (Review Whipping Cream, p. 82.)

Date Pudding

24 dates
½ c. powdered sugar
4 egg-whites (beaten stiff)
1 tsp. lemon juice

Cover seeded dates with cold water, cook until soft, and mash through a strainer. Cut and fold sugar and date pulp into beaten whites of eggs and add lemon juice. Pile lightly in a buttered pudding dish, cover, and set in a pan of hot water in a very moderate oven for ten minutes; then remove cover and cook until top is a light brown. Serve with whipped cream or a soft custard.

Rice Pudding with Eggs

1 c. rice
½ tsp. salt
2 tbsp. butter
2 c. boiling water
1 c. sugar
grating of nutmeg
4 eggs
2 c. milk

Wash the rice and cook in the boiling water until thick. Add milk, the yolks of eggs beaten slightly with the sugar, the salt, and nutmeg, and bake as directed for bread pudding. Cover with a meringue made of the whites of the eggs and one-fourth cup of powdered sugar.

Compare amount of liquid used in pudding with that for boiled rice (See p. 124). Compare texture of bread pudding and rice pudding. Which is stiffer? Why?

Individual Plum Pudding

⅛ lb. flour
½ tsp. salt
½ lb. suet
½ lb. currants
½ lb. dried figs
⅛ glass grape juice
4 eggs
⅜ lb. bread crumbs
½ tsp. nutmeg
½ lb. raisins (seeded)
½ lb. pecan meats
⅛ lb. brown sugar
¼ lb. candied orange peel

Mix flour, crumbs, nutmeg, and salt. Prepare the fruit and nuts as directed for fruit cake. Prepare the suet as for steamed pudding. Add the fruit and nuts to the flour mixture and moisten with the slightly beaten egg and the grape juice. Mold into balls the size of a small apple and tie tightly in stout squares of heavy white cloth that have been buttered and well floured. Drop into boiling water and boil for four hours. Remove the cloth; put each pudding on a dessert plate and garnish with a wreath of holly leaves, cut from angelica, and a cherry or red candies. Serve with hard sauce. The puddings may be kept in a cool place for several days. Do not remove the cloth. Reheat by steaming when ready to serve. If preferred the pudding may be steamed in a large mold for six hours.

This pudding is delicious but is rich and indigestible and should not be served frequently.

Apple Dumplings (No. 1)

1 c. flour
¼ tsp. salt
1 egg
6 tart apples
1 tsp. baking powder
⅛ c. butter
¼ c. milk
½ c. water

Pare the apples and then cut into quarters or thin slices. Place in a two-quart pan. Add the water, bring to the boiling point, and cook gently for ten minutes.

Mix the crust as for biscuit (p. 205), adding the slightly beaten egg to the milk. Roll it to fit the pan, lay it over the hot apples, and cut two or three gashes to let the steam out. Cover the pan tightly, place an asbestos mat under it, and cook for thirty minutes. Then brown in a hot oven and serve with hard sauce. If a steamer is at hand it may be steamed.

Apple Dumplings (No. 2)

Use the baking powder biscuit recipe, adding twice the shortening given for two cups of flour. This amount will make crust for eight dumplings. Roll the dough very thin and cut in squares large enough to cover the apples. Pare and core medium-sized tart apples that will cook quickly. Put the apple in the center of the square and draw the crust up over it, pinching the edges together. Trim off the crust at the top, leaving but a single thickness. Put the dumplings in a baking pan and cook for twenty-five or thirty minutes or until the apple is tender. Serve with hard sauce. Open the top of the dumpling and put the sauce directly on the apple when serving.

Peach Shortcake

Use the crust given for apple dumplings No. 1 and bake (do not steam). Pull apart and cover with sliced and sweetened peaches, either canned or fresh. Serve with cream or with the following sauce.

Sauce for Shortcake

1 tbsp. cornstarch
2 tbsp. butter
any desired flavoring
1 c. boiling water
½ c. sugar
1 egg

Cool a little of the water and mix the starch with it to a paste. Add the remainder and bring to the boiling point. Beat the egg until well mixed. Add sugar to it, then add it to the hot mixture, stirring all the time. Cook in a double boiler until the egg thickens. Add butter and flavoring, and serve.

Grape Juice Sherbet

6 tbsp. lemon juice
1½ c. sugar
2 c. grape juice
2 c. water
1 egg-white

Cook sugar and water together. Cool and proceed as for lemon sherbet.

Orange Ice

4 c. water
2 c. sugar
2 c. orange juice
grated rind of two oranges
¼ c. lemon juice

Proceed as for lemon sherbet.

Peach Ice Cream

Add one and one-half cups of peach pulp, rubbed through a sieve and slightly sweetened, to Philadelphia cream.

Caramel Cream

To one quart of Philadelphia cream made with only one-half cup of sugar add one-fourth cup of caramel syrup. (See Sugar.) Freeze to a mush, then fold in one cup of Italian meringue.

Italian Meringue

1 c. sugar
⅓ c. water
3 egg-whites

Proceed as for Ornamental Frosting and when stiff cook over hot water for three minutes.

Doughnuts

½ c. sugar
1 tsp. baking powder
½ tsp. cinnamon
½ c. sour milk
¼ tsp. soda
⅛ tsp. salt
1 tbsp. butter
1 egg
Flour to make a soft dough

Mix as directed for cookies, using one cup of flour and adding as much more as necessary. Roll to a quarter inch in thickness. Cut with a doughnut cutter. Fry as directed (p. 228) and drain.

Doughnuts should rise quickly to the top of the fat and brown on one side, then be turned and browned on the other side. If the fat is too hot the outside will burn before the doughnuts rise and before the center is cooked; if not hot enough they will be greasy. Doughnuts are very indigestible. Estimate the cost of a dozen doughnuts.

EGGS

Soft Custard

A soft custard is most delicate if made with the yolks only. The whites may be beaten until light and folded into the hot custard just before removing from the fire. Proceed as for cup custard. Return it to the double boiler and cook until it coats the spoon. Do not let the water underneath boil. Why? Strain through a fine strainer and cool, then flavor. Custards are flavored when cool because the flavoring is driven off by heat.

Scrambled Eggs

5 eggs	½ tsp. salt
⅛ tsp. white pepper	2 tbsp. butter

Beat the whites and yolks together slightly with a dover egg beater. Add pepper. Melt the butter in a smooth frying pan, and when the pan is moderately hot, turn in the eggs. Cook slowly (stirring all the time) until creamy and of the desired firmness. Then add salt. Serve on a warm dish. One-half cup of milk or of cooked tomato may be beaten with the eggs, or a tablespoonful of cooked chopped ham may be allowed for each egg.

Shirred Eggs

Carefully butter shirring dishes or custard cups with melted butter and drop an egg into each. Cover with bread crumbs if desired. Set the cups in a pan of hot water and cook in a moderately hot oven for eight or ten minutes or until firm, but not hard. Sprinkle with salt and a little pepper, and pour over each a little melted butter. Serve in the cups. A pudding dish may be used to cook several eggs together. This method may be varied by turning the egg from the cup on to a round of toast. Arrange the toast on a platter and pour around it a thick tomato sauce, garnishing with green peas; or, two tablespoonfuls of White Sauce No. 2 and a little grated cheese may be placed in cups before eggs are put in. Cover the eggs with a little of the sauce and sprinkle lightly with cheese. Cover the cups while cooking. Tomato sauce may be used and the cheese omitted.

Stuffed Eggs

Peel hard cooked eggs and cut in half horizontally or lengthwise. Remove the yolk, mash, and season with salt, pepper, and melted butter. Refill the whites even with sides, and with a damp cloth remove any yolk that adheres to edges. Serve with thin slices of boiled ham. For picnics wrap each egg in paraffin paper.

Goldenrod Eggs

Cut hard cooked eggs in half, remove the yolks, cut the white in rings, and arrange on a large platter. Mash the yolks, season with salt, press through a potato ricer over the whites, garnish with parsley, and serve.

Fried Eggs

This is the most indigestible way of cooking eggs. If the fat is hot enough to make the egg appetizing, the albumin is overcooked.

Use one tablespoonful of any good fat for each egg, melting the fat in an omelet pan. When moderately hot, slip the egg in and cook until firm.

Turn if desired. The heat must not be great enough to brown the edges. A large quantity of fat may be used and dipped over the egg, which need not be turned.

FISH

Broiled Pompano

Pompano must be broiled whole as its delicate flavor is destroyed by being split. Clean and dress the fish, place in a well-greased broiler, and broil over the coals, turning frequently. Be careful not to let it scorch. Cook for twenty-five minutes. The broiler may be put over a pan in the oven after the fish is thoroughly heated. To carve pompano, the bones must be removed. With a sharp knife loosen the fin and slip it out, bringing the bone with it. Then beginning at the tail slip a knife up the backbone and turn half the fish back from the bone. Then slip the knife beneath the under side of the bone and slip it out. Cut in slices crosswise and serve with maitre d'hotel butter.

Fried Fish

Frying is not a hygienic mode of cooking, but it is about the only satisfactory method for the small, bony fish, such as perch. Clean the fish, retaining the head, fins, and tail. Sprinkle with salt and roll in cornmeal. Put a large quantity of fat to heat in a deep kettle over a moderate fire before salting the fish. When the fat is hot, put in only a few fish at a time so as not to cool it. Turn them frequently until they are cooked to a golden brown. Drain on absorbent paper and serve. Large fish may be cut in pieces of uniform thickness and fried in this way.

Broiled Salt Mackerel

Wash the mackerel and soak over night in enough cold water to cover well. If very salt use a large quantity of water. Drain and dry on a cloth, and cook in a well-greased broiler under the gas flame for fifteen minutes. Sprinkle with salt if needed. Serve with a little melted butter and sliced lemon.

Salmon Salad

1 c. canned salmon
Mayonnaise enough to moisten
½ c. finely chopped celery
a crisp lettuce leaf for each service

Flake the salmon and sprinkle the celery with lemon juice. Mix salmon and celery and moisten with Mayonnaise. Heap it on lettuce leaves. Salmon may be seasoned with orange or lemon juice and salt and served on lettuce leaves.

FROSTING

Caramel Frosting

2 c. sugar
2 well beaten egg whites
2 tsp. vanilla
1 c. boiling water

Heat one-half cup of sugar to a rich brown (See Caramel Syrup). Add one-half cup of water, and cook to a thick syrup. Add remainder of the sugar and water and proceed as for ornamental frosting.

Orange Frosting

1 c. sugar
1 well-beaten egg-white
½ c. orange juice
peel of 1 orange (grated or shredded)

Proceed as for plain frosting, straining syrup over egg through a sieve.

Chocolate Frosting

1 c. sugar
¼ c. boiling water
2 well-beaten egg-whites
1 square of bitter chocolate
1 tsp. vanilla

Melt chocolate in water, add sugar, and proceed as for ornamental frosting.

Fudge Frosting

1 c. sugar
1 square chocolate
1 tsp. vanilla or ⅓ tsp. cinnamon
⅓ c. milk
2 tbsp. cream

Proceed as for fudge.

Mocha Frosting

2 tbsp. butter
2 tsp. cocoa
9 tbsp. sugar
1½ tsp. coffee infusion

Mix sugar and cocoa. Proceed as for hard sauce, adding coffee a drop at a time. It should be of the consistency of moderately firm butter. It may be spread on crackers and served with coffee or chocolate.

FRUITS

CANNED FRUITS

Plums. Select firm, well-colored fruit. Wash clean, pack in jars, and proceed as for peaches.

Pears. Choose ripe but not soft fruit. Peel, and cut into quarters or halves. Use six tablespoonfuls of sugar to a quart jar. Proceed as for peaches, boiling for fifteen minutes after sealing on the first day, and for twenty-five minutes on second and third days.

Hard pears must be cooked in a little water until tender, then canned.

Huckleberries. Wash and pick from stems. Pack in jars. Proceed as for peaches, omitting sugar. Boil for five minutes, seal, then boil for ten minutes. Boil for fifteen minutes on second and third days.

Canned Cherries. Wash firm red cherries and scoop out the pits with the loop of a new wire hair pin so as to keep the fruit in shape. Measure the fruit and add an equal quantity of sugar. Heat very slowly for half an hour, then boil rapidly for five minutes. Seal as directed for other fruits.

HOMINY

Coarse Hominy

Use one tablespoonful of butter to four cups of hominy, and cook in a fireless cooker. When tender, drain and keep in a cool place until ready to use. Then cover with boiling water, heat very hot, drain, and serve with cream, or season with butter and salt and serve with broiled ham.

JELLIES

Apple Jelly

Use firm sour apples. Remove a small section from stem and blossom ends, cut into quarters or eighths. Put into kettle and add nearly enough water to cover. Cook gently until soft. Stir well, rub through a coarse sieve, then pour pulp into a jelly bag. When strained add one pound of sugar to each pint of juice and finish as directed for plum jelly.

Cranberry Jelly

Select firm berries. Use proportions of berries and water given for cranberry sauce (p. 87). Cook for ten minutes, then proceed as for plum jelly. Use one cup of sugar for each cup of juice.

Wild Grape Jelly

Proceed as for plum jelly, using one pound of sugar to each pint of juice.

Mint Jelly

Add ¼ c. sugar, ¼ tsp. salt, and ¼ tsp. paprika to the hot mint sauce given on page 377, and pour it over one and one-half tablespoonfuls of gelatine soaked in one-fourth cup of cold water, stirring until dissolved. Add enough coloring to give a green tint if desired. Pour a part of the jelly into the mold. When cool add a few fresh mint leaves, place the mold in a pan of ice, and when firm pour in the remaining jelly.

Vegetable Jelly

2 c. medium shredded cabbage
1 medium-sized slice of onion shredded
¼ c. vinegar
½ tsp. celery seed
¼ c. water
2 pimentos, or two green peppers cut fine
¼ c. brown sugar
½ tsp. salt
½ tsp. mustard seed
1 tsp. granulated gelatin

Put the gelatin in a small bowl, add the cold water, and set in a vessel of hot water to dissolve the gelatin. Mix the vinegar, sugar, and seasonings. Add the mixture to the dissolved gelatin, and mix with the shredded vegetables. Place a smooth mold in ice water, decorate the sides with figures cut from pimentos, dipping the pieces in a little of the dissolved gelatin. When firmly attached, put in the vegetable mixture and set on ice to harden. This may be kept for two days.

MEAT

Braised Beef

2 lbs. of meat from round
2 tbsp. carrot
2 tbsp. onion
2 tbsp. fat salt pork
2 tbsp. turnip
2 tbsp. celery salt
1 c. soup stock, canned tomatoes, or water

Chop and mix the vegetables. Reserve three tablespoonfuls for the top of the meat, and spread the remainder in a small baking pan that can be closely covered. Sprinkle the meat lightly with salt, dredge with flour, and lay it in the pan, and brown well in a quick oven. Add stock or tomatoes and peppercorns. Spread on the vegetable mixture, cover closely, and cook gently for three hours or until tender. A small pot may be used for this instead of the pan. When ready to serve, remove the meat and thicken the sauce with a little browned flour if it is not thick enough. Add salt to taste. Pour a few spoonfuls of sauce over the meat and serve the remainder in the gravy dish. A round steak or a thin piece of flank may be spread with the vegetable mixture, rolled, tied, and cooked in the same way. Very slow cooking is essential after the meat is seared over, otherwise it will be tough. A granite or enameled utensil is best for the cooking dish.

Browned Hash

Cut cold meat, soup meat, roast, or stew into small cubes. Never mince as it is not appetizing when very fine. Use not more than one-

fourth as much fat as lean meat. Measure the fat and meat and add an equal quantity of cooked potato (cut into small cubes). Mix and sprinkle lightly with salt, add a little onion juice if desired, and moisten with a good stock or gravy, or a little milk or cream. Grease a frying pan liberally with beef or bacon fat, turn the hash in, and smooth the top carefully. Put the pan in a moderately hot place and cook about twenty minutes, or until the bottom is nicely browned.

Beef Balls in Fireless Cooker (Class Recipe)

A steak from the round may be utilized for this dish. Cut in pieces two and one-half inches long and one and one-half inches wide. Chop the meat trimmings fine and with it a half inch square of salt pork. (This is called "forcemeat.") Add to the chopped meat and pork one-half their measure of cracker crumbs rolled and sifted. Season with salt and a little onion juice or finely chopped onion. Moisten with beaten egg, mixed with an equal quantity of cold water. Spread the pieces of meat with a thin layer of the mixture, taking care not to spread the paste to the edge. Roll the strips of meat and fasten with toothpicks. Cook a slice of pork in a frying pan. Sprinkle the rolls lightly with salt, dredge with flour, and brown quickly in the bacon fat. Lay the rolls in the cooker bucket, pour on equal parts of hot water and hot soup stock to cover, put lid on closely, and place in the cooker on a hot radiator. Cook for three hours.

Veal Pie (Class Recipe, Group of Four)

½ tsp. salt
2 tbsp. butter or drippings
2 lbs. veal from shoulder
3 tbsp. flour
dash of pepper

Veal is dense in structure and requires thorough cooking.

Proceed as for stew, cook until tender, thicken the gravy with the flour, add seasoning, and turn into a baking dish, reserving enough of the liquid to serve as sauce with the pie. For the crust use the dumpling recipe, adding one-fourth cup of shortening (lard or butter, or equal parts of each). Mix as directed for biscuit, drop from a spoon on the hot meat, and bake for twenty-five minutes in a quick oven.

Veal Loaf

2 lbs. veal
½ tbsp. chopped onion
4 soda crackers
½ tsp. paprika
2 eggs
grated rind of ¼ lemon
⅛ lb. salt pork
1½ tbsp. green pepper
1 tsp. salt
½ tsp. thyme
3 tbsp. tomato purée
3 tbsp. lemon juice

Put the veal and pork through a chopper, and roll the cracker crumbs very fine. Mince the onion and pepper, rejecting the seeds of pepper. Add seasonings to the meat, then the cracker crumbs, then eggs, white and yolks beaten together. Mix and form into a compact roll of even thickness. Lay a slice of salt pork in a baking pan adapted to the size of the roll and place the meat on it. Cook in a moderately hot oven for two hours, basting every ten minutes with the fat in the pan. The loaf may be packed in a mold or large baking powder can and steamed for two hours, then baked for one-half hour in a moderately hot oven. Serve hot with brown or tomato sauce, or use the loaf cold. Beef or mutton may be substituted for veal.

Breaded Mutton Chops Baked (Class Recipe 1 Chop)

6 chops	1 egg
salt	1 tbsp. milk or water
1 c. bread crumbs	pepper

Trim the chops, removing most of the fat, if very fat. Wipe, then sprinkle lightly with salt and pepper; dip in egg and crumbs (see page 122). Have ready a baking pan of suitable size, rubbed lightly with lard or suet. Lay the chops in it and cook in a moderately hot oven for twenty or thirty minutes. If the chops are fat, no basting will be needed. If basting is necessary, use two tablespoonfuls of melted butter. When brown and tender lay on a hot platter and serve with a tomato sauce. Veal cutlets may be prepared in the same way.

Roast Leg of Lamb

Remove the thin dry skin from a leg of lamb and proceed as for roast beef. Dredge the bottom of the pan with flour, and set it in a hot oven. As soon as the flour browns, add a little hot water to the pan and baste the meat with it every fifteen minutes. Cook until tender—about one and three-fourths hours being needed for the average-sized leg. Make a gravy of the liquid in the pan as for roast beef. Serve with mint jelly, or omit the gravy and serve with mint sauce.

Roast Pork

Prepare the meat as directed, score the rind in inch slices, and proceed as for beef, baking in a moderate oven for three or four hours according to size. A double roasting pan is very useful for roasting pork. If the oven is too hot, the rind will burn, and the appearance of the roast will be spoiled. Serve hot or cold.

Pork Sausage (Class Recipe)

In localities where pork is plentiful, a lesson on sausage making will be very useful. Much of the sausage in rural districts is not wholesomely or palatably seasoned.

For a class of twenty, at least three pounds of meat, a large dried Mexican pepper, and a little finely powdered sage will be needed. Proceed as directed for Hamburg steak. Weigh the meat used, measure the pepper, salt, and sage. If in a farming district, let the pupils write a recipe, using six pounds of meat. Pork sausage served with grits or lye hominy is a distinctive Southern dish.

1 lb. meat	a little powdered sage
½ medium-sized red pepper	a little salt

Cut the meat into strips, sprinkle with the salt, sage, and pepper which has been powdered. In preparing the pepper remove the seed and dry the remainder in the oven, being careful not to overheat. Tie it in a cloth and pound until well powdered. Pass the meat through the meat chopper twice, pack in an earthen bowl, and let stand for two or three hours, or preferably over night. If wanted for breakfast, the sausage should be made the night before. It may be kept for several days in a cool place. When ready to cook, mold into small flat cakes and cook in pork drippings or lard for twelve minutes.

Liver and Bacon

Liver should be clear, not mottled. If the fresh cut surface leaves a yellow stain on the hand, it is diseased and not fit for food.

Cut the liver into slices half an inch thick, cover with boiling water, and let stand for five minutes. Drain and dry on a cloth. Remove the thin skin and the veins. Broil the bacon in small frying pan, drain off the fat, and broil with the liver in the same pan, which should be well coated with fat. Cook for five or six minutes, turning often. Sprinkle with salt and serve on the platter with the bacon.

Broiled Ham

As ham is difficult to digest, it should be used in moderation.

Remove any mold that may be on the ham and wipe clean. Take off the skin as far back as the ham is to be sliced. Keep the cut surface smooth. Cut it thin, and if very salt, cover the slices with warm water or with milk for from fifteen to thirty minutes, then drain. Pan broil until slightly brown, turning frequently. Drain most of the fat from the pan, leaving about four tablespoonfuls. Pour this over the ham,

and pour one tablespoonful of boiling water into the pan; shake over the fire for a moment, then pour it into the meat dish. A poached egg may be placed on each slice and the dish garnished with parsley.

Ham Boiled and Baked

Select a medium-sized fat ham, as the very large hams are apt to be coarse and the small ones have too much lean meat. Scrub the ham very thoroughly with a brush, trimming off the mold if necessary, and cutting off the hard skin at the small end. Place the ham in a large kettle and cover with cold water. Bring to the boiling point and boil for five minutes. Then lower the heat and let simmer for four or five hours according to size. During the latter part of the cooking the heat must be very gentle or the flesh will be broken. When tender remove from the fire, and when partly cool lift from the water. Take off the skin except for a small section near the small end. Press cloves in an inch apart, rub with brown sugar, and cover with fine cracker crumbs. Bake in a very slow oven for an hour, taking care that the crumbs are not scorched. Serve cold and cut in very thin slices.

To keep a ham in shape for carving it is well to saw off the bone each time. This can be done without spoiling the flesh if a small sharp saw is used. The ham may be served warm by putting it in a moderate oven for fifteen minutes.

Hocks and Other Bones

In boning fresh ham and shoulder, there is usually some flesh left on the bones; these bones with the joint above the foot, which is known as the hock, are usually salted or pickled, and then served boiled. Use the thin pieces first as they will dry more quickly than the thick ones.

Wash the bones in cold water, place them in a deep saucepan or pot, and cover with cold water. Bring slowly to the boiling point, and cook gently. Cook the thick pieces a little longer than the thin ones. Serve hot or cold.

OYSTERS

Broiled Oysters

Wash large plump oysters as directed and dry on a soft towel. With a silver fork lift each oyster by the tough part and dip into melted butter, then into fine cracker crumbs seasoned with salt and pepper. Lay on a buttered broiler and broil over a hot fire until the edges begin to curl, turning frequently. Serve immediately with lemon juice and butter. Oysters may be cooked under the gas flame if a very hot pan is used. After a few moments under the flame put the pan over a burner or on the bottom shelf of a very hot oven.

Oyster Cocktail

6 small oysters for each service
1 drop of tabasco sauce
½ tsp. lemon juice
1 tbsp. tomato catsup
1 tsp. shredded celery
salt

Pick off all bits of shell and wipe the oysters with a cheesecloth wrung out of cold water. Mix the oysters and other ingredients and chill thoroughly. Then salt to taste. Serve immediately in cocktail glasses or in green pepper shells arranged on cracked ice.

Scalloped Oysters

4 c. oysters
⅓ c. butter
⅛ tsp. cayenne
2 c. bread crumbs
½ tsp. salt
½ c. milk or liquid from oysters

Prepare and wash the oysters as for oyster stew. Mix butter, salt, and cayenne with bread crumbs. Grease a shallow baking dish with a little butter. Put in one-half cup of the bread crumbs, then add half the oysters. Cover with a half cup of crumbs, then the remaining oysters, then crumbs. Bake in a moderate oven from thirty to forty minutes.

PIE

Sweet Potato Pie

2 c. boiled sweet potato
⅜ c. butter
¼ tsp. grated nutmeg
½ c. sugar
3 eggs

Wash and pare the potatoes. Cut in half if large. Cook in boiling water until soft and mushy. Lift from the water with a skimmer, mash, and add salt, sugar, and butter. Beat well and add the egg yolks slightly beaten. Line a pie plate with pastry, put on a fluted rim, and pour in the mixture. Cook until firm to a rich brown. Put the pie into a hot oven and lower the heat after the first ten or fifteen minutes to avoid overcooking the filling. Serve hot or cold. Make a meringue of the whites as in Cup Custard.

Pumpkin Pie

1 c. steamed dry pumpkin
½ c. sugar
2 tbsp. butter
1 tsp. cinnamon
½ tsp. salt
1 c. milk or milk and cream
2 eggs
2 tbsp. molasses
½ tbsp. ginger

Rub the pumpkin through a sieve. Add milk, sugar, eggs (slightly beaten), spices, salt, molasses, and butter. Beat well and pour into patty shells lined with a rich paste. Bake as directed for potato pie and do not let the filling boil. This quantity will fill ten shells.

PRESERVES

Apple Butter

To the pulp and juice remaining from apple jelly add two parts of sugar to three of pulp, and a few sticks of cinnamon. Cook gently until a glaze forms on the surface when tested as directed for jelly. Seal while hot.

Fig Preserves

Wash and peel the figs. Weigh, allowing one-half pound of sugar for each pound of figs. Cover the figs with sugar and let stand for several hours, then cook gently for about three hours until tender and clear. Then seal. Allow one lemon for each gallon of figs.

Tomato Preserves

Peel the tomatoes and remove the tough core. Weigh, allowing one pound of sugar to each pound of fruit, and one lemon (sliced) and four one-inch pieces of ginger to each gallon of tomatoes. Put the tomatoes into a preserving kettle and add the sugar, lemon, and ginger. Cook gently until thick and clear. Seal immediately.

Watermelon Rind Preserves

Pare the rind and cut it into strips two inches wide and three inches long, removing all the pink part. Cover with cold water and bring to the boiling point. Cook gently for ten minutes, drain, then weigh and use a pound of sugar to each pound of rind. Make a syrup of the sugar and use a half cup of water to each pound of sugar. Boil this for ten minutes, then add the rind and cook until all is tender and clear. Pack in sterilized jars, fill with the hot syrup, and seal.

PUNCH

Caterer's Punch

5 doz. medium-sized lemons
3 qt. cans sliced pineapple
6 qts. iced Apollinaris water
6 pts. water
5 doz. medium-sized oranges
1 pt. fresh or canned cherries
6 pts. sugar
yellow rind of ½ doz. oranges
yellow rind of ½ doz. lemons

Grate or peel off in very thin slices orange and lemon rind. Put both into a saucepan. Add water and sugar and boil for ten minutes. Strain and cool. Squeeze oranges and lemons, and strain through cheesecloth. Add cherries, cut in half (fresh ones must be stoned); add pineapple, cut in cubes and aired for one-half hour. Then add cooled syrup. Put into a stone jar, and pack in ice. An ice cream freezer or fireless cooker will be very good for packing it. When ready to serve, turn into a punch bowl and add Apollinaris water.

SALADS

Sliced Cucumber Salad

Cucumbers must be very fresh and tender. Pare them, removing a thin slice from each end. Drop into ice water for a short time. When ready to serve, dry and cut into thin slices. Serve with French dressing (see Fats) or with salt and vinegar. Serve the dressing separately.

Grape Fruit Salad

Cut fruit in half. Remove the sections of pulp with a knife. Drain and arrange on lettuce leaves. Cover with French dressing (see Fats). Serve with broiled fish.

Tomato and Pineapple Salad

Peel the tomatoes, remove a slice from the stem end, and take out the seed. Fill the cavity with finely chopped celery, pecan, or walnut meats, and canned pineapple chopped and drained. Then arrange on a lettuce leaf, cover with Mayonnaise (see Fats), and serve as a salad.

A Delicious Dressing for Fruit Salads

4 egg yolks
1 tbsp. mustard
1 tsp. sugar
1 c. thick cream
4 tbsp. tarragon vinegar
1 tsp. salt
1 drop vanilla

Proceed as for cooked dressing. Cook until thick. Keep in a cool place over night. Add vanilla and cream, and whip until stiff.

SANDWICHES

Sweet Sandwiches

For sweet sandwiches use a paste made by grinding clean dried fruits and nuts in the food chopper. Moisten with syrup or lemon juice and spread between buttered bread. Dates, figs, raisins, and roasted

peanuts with the brown skins removed, blanched almonds, and walnuts are all good. A little firm preserve such as pear or quince may be drained and dried in a slow oven, then sliced and sprinkled with nuts.

Ham Sandwiches

Grind one cup of boiled ham through the meat chopper, add one-third cup softened butter, rub to a paste, and spread between thin slices of bread.

Hot Meat Sandwiches

Place a slice of reheated or freshly roasted meat on a slice of crisp toast and pour over it a little gravy or white sauce. Lay another slice of toast upon it, and pour on more gravy. White sauce is used for chicken and other white meats.

Lettuce Sandwiches

Prepare the lettuce as for salad. Lay a crisp leaf on a triangle of buttered bread, and cover with Mayonnaise. Sprinkle on a few nuts, and lay on another slice, letting the edges of the lettuce show at the sides.

Bread and Butter Rolls

Remove the crust from a warm loaf of fine grained bread, and cut into thin slices. Spread with softened butter. Roll and tie with a tiny ribbon.

Aviation Sandwiches

Combine a piece of dough from nut and date bread with a piece of white bread dough, so that the finished loaf will be varied in color. Bake in a long loaf, cut in rounds, using a filling of cottage cheese moistened with cream, and chopped olives. Season with salt.

Pimento Sandwiches

Cook white bread in a pound baking powder can. Slice thin, butter, and cover with narrow slices of pimento. Moisten with a little Mayonnaise and lay another round over it.

Salad Rolls

Remove a round from the top of small rolls, fill with minced chicken highly seasoned, and moistened with a rich sauce. Replace the lid and serve in a shallow basket on a soft doily.

Biscuit Sandwiches

Split and butter biscuit and spread with minced ham or chicken.

Brown Bread Sandwiches

Cut the bread, trim, and butter. Then fill with nut and fruit paste.

SAUCE

Mint Sauce

¾ c. chopped mint leaves 2 tbsp. sugar 1 c. vinegar

Heat the vinegar and sugar in a double boiler, stirring well so that sugar is dissolved. Add mint and let stand in a warm place for half an hour. Strain, add a little salt if desired, and serve in a gravy dish.

SOUPS

Cream of Celery Soup

2 c. white stock
2 c. scalded milk
3 c. celery cut in short lengths
1 c. cream
1 slice onion
2 tbsp. butter
3 tbsp. flour
salt to taste

Cover the celery with boiling water and cook for ten minutes. Drain and cover with the stock. Cook until tender, then proceed as for pea soup, adding cream last. Reheat in double boiler if needed. Milk may be used instead of cream, one tablespoonful of butter being added.

Tomato Soup

4 c. tomato
1 slice onion
2 tbsp. chopped celery
(or 1 tsp. celery seed)
3 tbsp. cornstarch
2 c. water
½ bay leaf
2 tbsp. butter
3 tbsp. cold water

Cook water, vegetables, and bay leaf over a moderate heat until tender, then rub through a sieve. Add the cornstarch mixed with the cold water. Cook until transparent and then add salt and butter. Beat with a dover egg beater. Serve hot with croutons.

Cream of Potato Soup

Mix one cup of hot thin white sauce with one cup of well mashed hot potato. Season with salt and a few drops of onion juice.

Noodle Soup

1 qt. stock
¼ c. noodles

Macaroni, rice, or vermicelli may be used instead of noodles. Let simmer until tender.

Lima Bean Soup

2 c. dried beans
1 tbsp. chopped onion
1 c. scalded milk
¼ c. butter
salt to taste
6 c. cold water
1 tbsp. chopped carrot
2 tbsp. flour
¼ tsp. white pepper

Wash the beans and soak over night. Cover with cold water, add onion and carrot, and cook until the beans are tender. Rub through a sieve, then proceed as for cream of pea soup.

STUFFINGS

Oyster Stuffing

1 pt. oysters
½ c. butter
salt to taste
¾ c. bread crumbs
⅛ tsp. onion juice

Remove the bits of shell from the oysters and wash well, using very little water. Drain, add bread crumbs, butter, and seasoning. If a very soft stuffing is desired moisten with water or rich milk. A large gobbler will require two quarts of stuffing.

Chestnut Stuffing

1 qt. large chestnuts
¼ tsp. white pepper
1 tsp. salt
3 tbsp. butter

Shell and blanch the chestnuts, cover with boiling water, and cook slowly until tender. Drain, rub through a colander, then add salt, pepper, and butter (melted).

TEA

Iced Tea

Make as directed for hot tea, using twice the quantity of tea. Pour directly into a glass one-third full of ice and serve immediately. If the tea is to be kept, drain it from the leaves after three minutes. A few clean crisp mint leaves may be put into the glass before pouring in the tea.

VEGETABLES (CANNED)

Corn with Tomatoes

Use one-third corn and two-thirds tomatoes. Add one-fourth teaspoonful of salt to each pint. Pack tightly in jars, fill with tomato juice, and then proceed as for canned corn.

Canned Tomatoes

Select firm, ripe, dark red tomatoes. Put them into a sack or a wire basket and immerse in boiling water for one minute. Drain, peel, cut out all hard or imperfect parts, pack in jars, and proceed as for corn, boiling for ten minutes. Seal. Then boil for twenty minutes more. Boil for thirty minutes on each of two succeeding days; or cut tomatoes in pieces, boil in a kettle until tender and quite thick, fill hot sterilized jars, and seal immediately. Tomatoes, being very acid, are easily kept.

Okra

Wash tender okra pods cut into short pieces. Proceed as for beans.

Okra and Tomatoes

Prepare each vegetable as directed. Use one part okra and two parts tomato pulp. Proceed as for vegetables.

Mixture for Soup

To a pint of okra and tomatoes add one medium-sized carrot scraped and cut into thin slices, and one sprig of parsley. Proceed as for mixed vegetables. Any other pleasing combination of vegetables may be made. The flavor of onion is impaired by heat and it is well to add it when making soup.

Sweet Potatoes

Boil the potatoes until the skin will peel off easily, and cut into cubes. Pack tightly in jars. Add one-fourth teaspoonful of salt and one tablespoonful of sugar to each pint. Fill the jars with cold water and proceed as directed.

Pumpkin

Choose firm sweet pumpkins. Peel, cut into cubes, and cook in a shallow kettle with barely enough water to prevent sticking, until slightly tender. Then proceed as for vegetables, or fill jars with cubes before cooking. The preliminary cooking removes some of the water.

Rhubarb

Select firm, choice stalks. Wash and cut into inch lengths. Pack in jars. Add six tablespoonfuls of sugar to each pint. Fill with clean cold water and proceed as for canned fruit, boiling for twenty minutes only on first day.

VEGETABLES

Potatoes Cooked with Roast Beef

Pare medium-sized potatoes. Cover with boiling water and boil for ten minutes. Then drain and put them into the pan with roast beef. Bake for forty minutes, basting them with the roast gravy.

Puffed Potatoes

Cut a slice from the top of hot baked potatoes, scoop out the pulp, and press it through a ricer. For six potatoes use three tablespoonfuls of butter, the whites of two eggs, and salt and pepper to taste. Stir in the seasoning and add the well-beaten egg; refill but do not pack the shells. Stand them in a baking pan, and cook until well puffed.

Boiled Sweet Potatoes

In the late summer before potatoes are well ripened they are not sweet and sugar may be added. Cook sweet potatoes as directed for boiled white potatoes. Pare while hot and cut in half. Sprinkle with sugar (allowing one-half tablespoonful for each potato), and a little salt. Lay on a greased baking pan and brown in a hot oven. A teaspoonful of caramel syrup poured over each half will give a pretty color and will improve the flavor. Pour a little melted butter (one teaspoonful for each potato) over them before serving, or serve with meat gravy.

Sweet Potato Cakes

¼ tsp. salt
2 c. mashed potato
1 tbsp. sugar
3 tbsp. hot milk
2 tbsp. butter

Mash hot boiled potatoes through a ricer. Add the milk and seasonings and stir well. Form into small cakes. Lay them on a greased pie tin, brush the top with caramel syrup, and cook in a hot oven for fifteen or twenty minutes.

Boiled Turnips

There are two kinds of turnips, the white and the yellow or rutabaga. The latter are more tender and of better flavor than the former. Serve them with pork or turkey.

Pare and cut them into quarters or slices. Cover with boiling water, and cook until tender—from forty-five minutes to three hours. Drain and mash if desired and season with butter and salt or cook one slice of salt pork with half a dozen turnips, or serve with white sauce.

Baked Squash

Cut in halves, remove seeds and strings, then cut in small pieces about two inches square. Lay in a baking pan, sprinkle with salt, and pour a half teaspoonful of molasses over each square. Cover and bake in a moderate oven until soft, from one to two hours. Remove the cover after the first half hour.

Kershaw

Cut the kershaw in half, remove the seeds, and bake in a moderately hot oven for three hours. Half an hour before serving time sprinkle with sugar. When done, spread with butter and a little salt. Cut the surface with a spoon so the seasoning may enter. Scrape down from the shell. Serve in the shell with chicken or beef.

Lima Beans

1 pt. beans
½ c. cream
salt to taste
1 tbsp. flour
1 tsp. butter

Lima beans, also called butter beans, have a very delicate flavor and must be cooked in as little water as possible. Do not use soda unless beans are old or the water is very hard. Shell, wash, and cook as directed for string beans. Buy fresh greenish beans or those with unwilted pods, if purchased shelled. Do not drain but cook down and use the liquid as sauce. Season with cream or butter, never with pork. If preferred, season with butter and omit the cream.

Black-Eyed Peas

1 qt. peas
1 tsp. butter
3 c. water
a pinch of soda

Select well filled peas having rich green shells. Reject all peas with black specks, as they may contain the larvae of some insect. Wash and cook as directed for string beans, using soda if water is hard. Cook liquid down to half a cupful. Add half a cup of thin cream rubbed with a tablespoonful of flour and bring to the boiling point. Salt to taste and serve, or cook with a slice of salt pork and omit butter and cream. Thicken the liquid with flour.

Stewed Corn

½ doz. ears of corn
1 tsp. sugar
½ c. boiling water
2 tbsp. butter
salt to taste

Husk, then score each row down the center with a sharp knife and press out the pulp. Melt the butter in a saucepan over a low heat. Add the pulp, stirring well for a few moments. Add half a cup of hot water and the seasonings. Cook on back of range for ten minutes, or stew corn in a double boiler for fifteen minutes, using milk instead of water.

Corn with Tomatoes

1 pt. stewed tomatoes
2 tbsp. butter
½ doz. ears of corn
salt to taste

Put the tomatoes into a smooth saucepan. Add corn prepared as in preceding recipe. Cook gently for fifteen minutes. Add seasonings, and serve.

Corn Pudding

2 tbsp. flour
2 tbsp. butter
⅓ c. milk
1 tsp. sugar
3 eggs
1 pt. canned or fresh corn

Beat the eggs slightly, rub the flour and milk to a smooth paste, add the eggs, then add melted butter and other ingredients. Turn into a pudding dish, set it into a pan of hot water, and cook in a moderately hot oven until firm. Test as directed for cup custard. Serve as a vegetable or for luncheon as a substitute for meat. What ingredients have a meat value?

Baked Tomatoes

6 medium-sized tomatoes
½ c. soft bread crumbs
1 tsp. chopped onion
2 tbsp. melted butter or fat from meat
a little salt
½ c. cold chopped meat, beef, chicken, etc.
1 tbsp. chopped ham
1 tsp. chopped green pepper

Wipe the tomatoes with a damp cloth. Cut around from the top of each, scoop out the pulp (which may be reserved for tomato sauce), sprinkle the inside with salt, invert the tomatoes, and let stand in a cool place for an hour. Mix the ingredients, sprinkling lightly with salt. Fill the tomatoes, and cook in a quick oven for twenty minutes. Baste with a little melted butter and serve hot.

Tomatoes may be stuffed with equal parts of chopped drained pulp and cooked rice (or cubes of bread), seasoned with butter and salt and a few drops of onion juice.

Broiled Tomatoes

Wash and dry the tomatoes, and cut into one-fourth inch slices. Rub a hot frying pan lightly with butter, put in the tomatoes, turn frequently to prevent burning as the pan must be very hot. Cook until tender—about five minutes. Season with salt and a little melted butter, and serve on a hot platter immediately. Serve with broiled meats.

Tomatoes with Okra

1 qt. okra
1 tbsp. butter
1 pt. tomatoes
salt to taste

Prepare the tomatoes as for stewing. Measure and turn into a smooth saucepan. Measure the okra, wash and cut it into rings one-fourth inch thick, and add it to the tomatoes, cooking gently until tender, about half an hour. Add butter and salt, and serve.

Stuffed Peppers

6 green peppers
1 c. bread in ¼ inch cubes
1 slice onion chopped fine
1 c. tomato sauce
1 c. meat ground in food chopper
1 tsp. salt
1 tbsp. melted butter

Choose plump, unwilted, light green, sweet peppers. Remove a small slice from the stem (the opening must not include the whole top of the pepper) and scoop out the seed, cover the peppers with boiling water, and let stand for ten minutes; then proceed as for stuffed tomatoes. When stuffed, set the peppers in an enameled baking dish. Pour around them the sauce and cook for forty-five minutes in a moderately hot oven, basting every ten minutes. Serve hot as a meat substitute. Omit the sauce if desired and pour a cup of boiling water and a tablespoonful of butter into the pan. Peppers may also be stuffed with seasoned bread cubes or equal parts of bread and tomatoes or with boiled rice seasoned with salt.

Baked or Broiled Egg Plant

Pare and cut into one-fourth inch slices, dip a piece of soft paper in warmed butter or other fat, and rub each slice lightly with it. Lay on a baking sheet and bake until tender and brown—about fifteen minutes. Arrange on a warm platter, spread with melted butter, dust with salt, and serve immediately.

Stewed Rhubarb

1 lb. sugar 1 lb. rhubarb

Wash the rhubarb thoroughly, but do not remove the skin. Weigh, put in a porcelain saucepan, and pour the sugar over it. Let stand on the back of range until sufficient sugar and juice have melted to prevent burning; then increase the heat and let simmer gently until tender. Do not stir while cooking, and turn contents of dish out very carefully.

White Beans with Rice

Cook the beans as for baked beans, using half the quantity of beans and pork and omitting the molasses. When the beans are quite soft, add one-half teaspoonful of salt and one cup of rice thoroughly washed. Cook for one hour without stirring, so that the rice will remain on top without burning.

Red Beans or Frijoles

2 c. beans ½ lb. salt pork
1 medium-sized onion ½ tsp. bicarbonate of soda
1 qt. cold water

Prepare the beans as directed above and soak over night. Drain, pour the cold water over them, add soda, and bring to the boiling point. Add the pork washed and scored, also the onion peeled (it may be sliced, but it cannot then be removed before serving). Cover closely and cook gently until the beans are soft, from four to six hours. Shortly before serving, the gravy may be thickened by mashing a spoonful of the beans against the side of the saucepan. Add salt to taste.

WHEAT

Cracked Wheat

Cook wheat as directed for hominy, except that butter is not needed. Keep in a cool place and reheat at serving time. Use for breakfast. If served with a little rich cream instead of milk, it is very valuable in preventing constipation.

EQUIPMENT FOR THE KITCHEN

Furniture

Kitchen table covered with enamel, glass, or zinc
Refrigerator
Fireless cooker
Towel rack (metal or glass)
Sink
Range, gas, oil, or electric cooking apparatus for hot weather
Stool
Kitchen cabinet (metal preferred)
Chair
Clock

Iron or Steel

Coal hod
Shovel
Poker
Lid lifter
Large frying pan
Covered roasting pan
Sheet steel biscuit pans
Food chopper
Griddle
Hammer
Cork screw
Can opener
Mattress needle
Galvanized garbage pail
Omelet pan
Sheet steel baking sheet
Loaf pans for bread (aluminum may be used)
Dover egg beater
Scales
Coffee mill (optional)
Long handled hook for drawing pans to edge of oven
Set of skewers

Tin

Block tin steamer, copper bottom (optional)
Biscuit cutter
Sifter
Flour bin japanned (not necessary if kitchen cabinet is used)
Apple corer
Grater
Bread box (japanned)

Wire

Soap shaker
Coarse strainer
Fine strainer
Extension strainer
Whisk egg beater
Sieve
Wire potato masher
Dish drainer

Aluminum

Graduated measuring cup, ½ pint
Double boiler
Teakettle
Flour dredger
Round tube pan for loaf cake
Two ten-inch tins for layer cake two inches deep
Colander (enameled ware may be used)

Pudding mold
Measuring cup, 1 quart
Two saucepans
Pepper shaker
Muffin pans
Oblong pan for loaf cake
Two or four perforated pie plates
Tea strainer (silver preferred)

Cutlery

Meat knife
Long-handled kitchen fork
Vegetable knife
Vegetable slicer with wooden frame (optional)
Four silver plated tablespoons
Long-handled spoon
Meat fork
Bread knife
Spatula
Cleaver
Scissors
Two silver plated teaspoons

Enameled Ware

Double boiler (aluminum may be used)
Dish pan
One pint lipped saucepan
Coffee pot (aluminum may be used)
Small funnel
Large funnel
Perforated skimmer
One quart lipped saucepan (larger saucepans may be used if family is large)
Two quart Berlin kettle
Soap dish
Sink strainer
Dipper

Wooden Ware

Perforated cake spoon
Bread board
Pastry brush
Meat board
Vegetable brush

Earthenware

Bowl, 1 pint
Bowl, 1 quart
Bowl, 8 quarts
Six or twelve custard cups
Set of bowls or dishes for baking
Teapot

Crockery

Cheap dishes, bowls and plates for ice-box, number and size to be determined by food to be stored
Two 2 quart pitchers

Glassware

Lemon squeezer
Glass baking dishes if not too expensive
Glass jars—1 pint, 1 quart, 1 gallon, as may be needed for supplies. If kitchen cabinet supplied with them is used few are needed
Graduated measuring cup
Jelly glasses

Miscellaneous

Asbestos mats
Ice mallet
Kitchen grindstone
Manila kitchen paper
Match safe
Ice cream freezer
Paraffin paper
Twine

EQUIPMENT FOR CLEANING AND LAUNDERING

Cleaning

Vacuum cleaner (if possible)
Oil mop
Mop handle for scrubbing
Two zinc pails
Hemmed dish towels (linen or cotton)
Broom
Floor brush
Dust pan
Hemmed cheesecloth dusters
Hemmed dishcloths
Dish mop

Laundering

Two or more stationary tubs, or zinc or enameled portable tubs
Copper bottomed boiler or large pot
Wringer
Two pails, zinc or fiber
Clothespins with spring (number depends on amount of clothes)
Ironing board with sleeve board attached
Sheet for board
Pad for board
Iron holder
Clothes horse
Scrubbing brush
White enameled tub for bluing
Washing machine (optional)
Wash board (glass)
Stick for punching clothes
Clothesline
One electric iron or three nickel faced irons
Stand for iron
Small brush

Special utensils may be provided for making and straining starch if the funds permit.

MONTH	DAY	ARTICLE	RECEIVED	EXPENDED (CHARGED)	EXPENDED (CASH)	TOTAL EXPENDED	FOOD	SHELTER	OPERATING EXPENSES	CLOTHING	HIGHER LIFE	CHARGED ACCOUNT PAID

MONTH	DAY	ARTICLE	RECEIVED	EXPENDED (CHARGED)	EXPENDED (CASH)	TOTAL EXPENDED	FOOD	SHELTER	OPERATING EXPENSES	CLOTHING	HIGHER LIFE	CHARGED ACCOUNT PAID
Totals brought forward												
This month's totals												
Last month's totals												
General totals												

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Food Exhibits

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Huyler, Cocoa Exhibit, Ining Place, New York City; Walter Baker's Chocolate, Dorchester, Mass.; Wheat Exhibit, Washburn & Crosby, Minneapolis, Minn.; Royal Baking Powder, Brooklyn, N. Y.; Burnett's Vanilla, Burnett Extract Co., Boston, Mass.; Corn Products, Corn Products Co., 17 Battery Place, New York; Sample Case of Spices, McCormick & Co., 105 Concord Street, Baltimore, Md.; Illustrative Material, Chart of Cow, Sheep, etc., The Sheerer Co., 410 West Twenty-seventh Street, New York City; "Side of Beef," Illustration, Richard Webber, New York City; Flour and Cereal Exhibit, Hecker Jones, Jewell Milling Co., Produce Exchange, New York City; Rice Exhibit, Rice Association of America, Crowley, La.; Cards illustrating tea, coffee, black pepper, vanilla, nutmeg, cloves, A. W. Mumford (Publisher), Chicago, Ill.

Charts

Langworthy Charts, 12 charts showing composition of foods. Price, $1.00, U. S. Department of Agriculture, Washington, D. C.; Meat Charts, Bureau of Publications, Teachers' College, Columbia University, New York City; 1 chart 2x3 feet of Animal, Price, $1.00; 1 chart 2x3 feet of Hind Quarter, Price, $1.00; 6 photographs of Beef Cuts, Price, 75 cents; Educational Food Analysis Set, Price, $16; Analysis of sixteen foods exhibited in bottles and representing food principles in one pound of food, Pratt Institute, Brooklyn, N. Y.; Meat Charts, four illustrating beef, mutton, veal, pork, Price, $10, Pratt Institute, Brooklyn, N. Y.

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Made in the USA
Lexington, KY
15 July 2010

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